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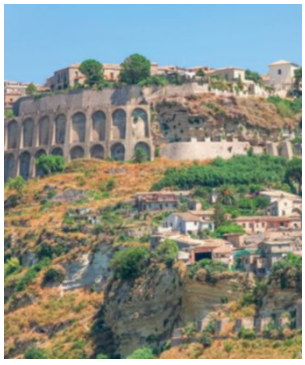

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EDITOR'S LETTER

NO PLACE LIKE HOME

Egypt's Final Redoubt in Canaan" (page 26), by contributing editor Roger Atwood, examines the three-centuries-long Egyptian occupation of Canaan. Beginning in 1458 B.C. with the defeat of Canaanite chiefdoms by the pharaoh Thutmose III, the colonizers sent natural resources and slaves back home to the Egyptian elite. Archaeological evidence is revealing the uneasy relationship between the occupied and their occupiers and how the Canaanites ultimately organized the fiery insurrection that ended Egypt's rule.

Eye of Horus

"The First Australians" (page 49), by Kate Ravilious, covers the work of archaeologists at the Warratyi rock shelter in the Flinders Ranges of South Australia. Warratyi, which is just big enough to stand in, would likely have been a place to rest and survey the landscape. Most significantly, the small stone tools and remains of extinct species discovered there are pushing back dates of human occupation in Australia's interior to more than 40,000 years ago.

Late Iron Age people in Britain, it was believed, were stripped of their cultural identity by invading Roman armies of the first century A.D. But in "Looking Beyond the Hillforts" (page 38), by contributing editor Jason Urbanus, the discovery of Duropolis, a 50-acre settlement in Dorset with no fortification walls, entirely overturns that view. Duropolis is now known to have been home to the Durotriges, a tribe recognized for their unique ritual practices.

Journalist Traci Watson brings us "A Residence Fit for a President" (page 34), in which archaeologists in Albemarle County, Virginia, have learned that the structure presented to visitors for more than a century as the family home of President James Monroe was, in fact, his guest house. A combination of archival research and careful excavation is now showing that Monroe was actually a man of considerable style who lived in a house befitting an American president.

An enormous burial mound, called Montegrande, is the starting point for "Letter from Peru" (page 55), by contributing editor Roger Atwood. Since archaeological work first began in the region in the mid-twentieth century, the ancient Amazon has been considered "the antithesis of culture." Now, however, it is proving to have been a vital center beginning at least 3,000 years ago. In addition, archaeologists are discovering common cultural signatures, possibly tied to the ritual use of hallucinogens, between the Amazon and the most significant ancient cities in the Andes.

Much in archaeology is the stuff of mystery, and the artifacts in "Set in Stone" (page 44), by deputy editor Eric A. Powell, are no exception. These inarguably beautiful objects, called bannerstones, were made by Archaic hunter-gatherers as much as 8,000 years ago, and are found throughout the eastern United States. But what they were used for remains an open question.

Enjoy!

Claudia Valentino

Claudia Valentino
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Director of Integrated Sales
Gerry Moss

Account Manager
Karina Casines

Account Manager
Jeff Posner
PRI Communications Inc.
Jeff@pricommunicationsinc.com
516-594-2820 x11

Circulation Consultant
Greg Wolfe, Circulation Specialists, Inc.

Newsstand Consultant
T.J. Montilli
Pro Circ Retail Solutions

Office Manager
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For production questions contact production@archaeology.org

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FROM THE PRESIDENT

A SOBERING MOMENT FOR PUBLIC OUTREACH

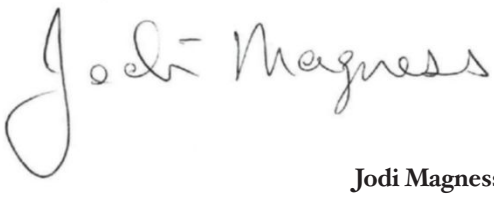
As this issue of ARCHAEOLOGY is being prepared, the United States government is considering budget cuts that would eliminate the National Endowment for the Humanities (NEH) and the National Endowment for the Arts (NEA). These federal agencies provide crucial funding for research, scholarship, and public outreach in the arts and humanities. The NEH, in particular, funds archaeological excavations as well as research and other programs.

Masada, Israel

This year I have been on a research leave funded by an NEH Public Scholar grant. It has provided me with the time I need to write about a subject that has long held my interest—the dramatic events that occurred 2,000 years ago atop Masada, a barren, windswept mountain overlooking the Dead Sea. There, 967 men, women, and children reportedly chose to take their own lives rather than suffer enslavement, torture, or death at the hands of the Roman army.

The story of Masada is related by only one ancient author, the Jewish historian Flavius Josephus. His massive seven-book account, *The Jewish War,* which describes the First Jewish Revolt against Rome and the destruction of Jerusalem and the Second Temple in A.D. 70, ends with the fall of Masada. The mountaintop site was excavated between 1963 and 1965 by the renowned archaeologist Yigael Yadin, who also served as chief of staff of the Israel Defense Forces. Masada is the second most visited archaeological site in Israel, thanks to its potent mix of archaeology and history. It is this story that I want my book to bring to the public.

This is the true meaning of public outreach—making scholarly work accessible to interested laypeople—something that we at the Archaeological Institute of America claim as a significant part of our own mission. We urge you to consider opposing cuts to the NEH and NEA budgets, and we express the gratitude of our professional members who have benefited from the support of these agencies over the years.



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FROM OUR READERS

We received a number of letters regarding "After the Battle" (May/June 2017), by senior editor Daniel Weiss, from readers who expressed a personal connection to the story.

I thought you might be interested in the legacy of one member of the "lost Scottish army" in your excellent article. In researching my family history, I discovered Duncan Stewart, a Scottish soldier, captured by Cromwell at the Battle of Dunbar, marched to Durham, held at the Cathedral, sent to London, shipped on the *Unity*, and sold to George Hadley, a farmer in what is now Ipswich, Massachusetts. He was one of the lucky ones.

Duncan, a respected Puritan, eventually married a servant in the house, Anne Winchester (or Winchurst), bought his own farm, raised 11 children, and held several town offices. His was one of the seven families who founded the new parish of Byfield, in northeastern Massachusetts. Both Duncan and his wife lived into their 90s and are buried in Rowley, Massachusetts. They have many descendants in New England today. They are my seventh great-grandparents.

I agree with author Daniel Weiss that Duncan must have been one of the hardier ones to survive all that he went through. I regret that I cannot know his thoughts about his new life and about the ultimate return of a Stewart to the throne of England, and what memories and homesickness he might have had. Thank you for an always-fascinating publication.

Doris Phillips
Manchester, CT

I was fascinated to read, in my favorite magazine, the story of the Scottish prisoners sent to southern Maine. My family has been in that area since between 1650 and 1670 and is well documented. The problem is that we have never been able to ascertain exactly when our ancestors arrived. We intermarried several times with the McIntire family, whose family home you pictured in your article. In our family history there is mention of a possible Scottish connection, but we never knew if that was the case or if we are English. I would like to know if there was a list of the prisoners on board the *Unity*. By the way, there is also mention in the family history of a Francis Came who was banished to Barbados for high treason, but died on the voyage.

Harry E. Came
Waukegan, IL

I enjoyed your article on the Battle of Dunbar. It is very thorough and provides lots of detail. I have Scottish ancestors who were already in America in the early 1700s that I haven't been able to trace back across the ocean. I don't suppose there exists a list (or partial list) of names of the Scotsmen from that battle who came over here?

Parker Gay
Salt Lake City, UT

We love your magazine and the recent article on the Scottish army. My wife is from Maine and her mother's maiden name is White. Her relatives are from southern Maine, where the name was originally spelled Hwite. They are believed to have come over as indentured servants in the 1600s. The family was always in the lumber business.
Recently we had our DNA analyzed and hers was 97 percent from the British Isles and mostly the Dunbar/York area. We want to investigate and see if there is a list of those that came over in 1650 and 1651.

Dave Brauer
Wexford, PA

Daniel Weiss replies: The discovery of the living connection to the Battle of Dunbar is an enormously gratifying aspect of the story. Descendants of these men have compiled a list, based on various records, of the surviving Scotsmen who were sent to North America after the battle. You can find the list, as well as other information, at scottishprisonersofwar.com.

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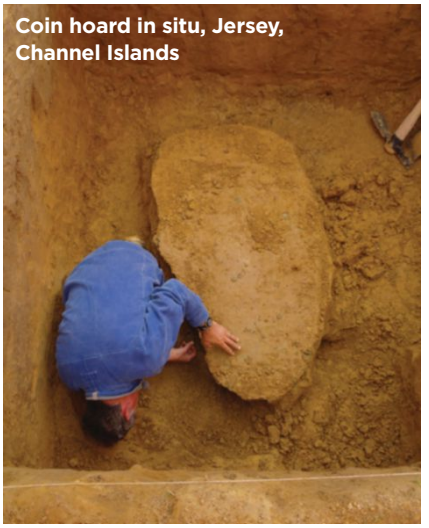
KA-CHING!

Celtic coin hoard

In 2012, a pair of veteran metal detectorists on Jersey in the British Channel Islands discovered a gargantuan coin hoard in a field they had been searching off and on for three decades. The hoard was the largest ever to have been found in Britain and appeared to have the potential to transform interpretations of Jersey's history. But first it had to be moved. Just getting it out of the ground was fraught with tension. "With earth still attached, it weighed over a ton," says Neil Mahrer, a museum conservator with Jersey Heritage. "We had no idea how strong it was, in that it was only held together by the corrosion between the coins."


Coin hoard in situ, Jersey, Channel Islands

Once the hoard was safely in the laboratory in the Jersey Museum in mid-2014, Mahrer and his team faced the next challenge: how to disassemble it. They also had a daunting deadline. Based on their funding, they needed to take it apart within three years. This would mean extricating almost 500 coins per week on average. Early on, their pace lagged as they learned to use a metrology arm that recorded the position of each coin to within one five-hundredth of an inch. A year into the project, though, with the help of a team of volunteers, they were removing up to 800 coins per week.

Along the way, Mahrer sought advice from the small club of fellow conservators with experience taking apart large hoards. To remove the corrosion from the coins, which were generally made with an alloy of silver and copper, experts at the British Museum recommended using a dilute solution of formic acid. To clean the gold jewelry embedded along with the coins—including up to 17 partial and complete gold torques—conservators who worked on the Staffordshire Anglo-Saxon hoard advised using thorns from the evergreen barberry shrub. "It turns out that this one particular thorn is soft enough not to scratch the gold surface, but will remove the corrosion and dirt," says Mahrer. "It's strange to think that the best way to clean these was a technique that could have been used as far back into the past as one goes."

FROM THE TRENCHES

Silver coin

In late January 2017, months before the three-year deadline, the final pieces were detached. "We had to take this thing apart literally one coin at a time while having no idea what was inside," says Mahrer. "Right up to the end, we were surprised all the time by finding new things." The tally of coins now stands at around an astounding 69,000, though this includes an estimate of the number contained in a small cylindrical section set aside intact for future study.

The great majority of the coins have been associated with the Coriosolites, a Celtic tribe known to have controlled a small area of mainland France close to Jersey. Originally, the hoard was thought to have been buried for safekeeping around 50 B.C., when the Romans were making their way through France, conquering Celtic tribes as they went. However, Olga Finch, head of archaeology at Jersey Heritage, notes that a smattering of the coins are thought to date to around 40 B.C., suggesting the hoard may have been buried after the conquest. Even given this later dating, it might still represent an attempt to hide wealth from the Romans. It's also possible that the hoard—and a number of others that have been found on Jersey—was left with no intention of recovery. "Maybe it's not about hiding your wealth," says Finch. "Maybe it's more about ritual and showing that you have so much wealth that you can afford to bury some of it as an offering to the gods." Go to archaeology.org/celtichoard to watch a time-lapse video of the team disassembling the hoard.

–Daniel Weiss

OFF THE GRID GAMLA UPPSALA, UPPSALA, SWEDEN

Legend, historical accounts, and archaeology are in agreement that Gamla Uppsala, in southeastern Sweden, was the home and burial place of the kings of the fifth- and sixth-century Ynglinga Dynasty. These monarchs reigned during the time depicted in the Old English epic poem Beowulf. *Until the arrival of Christianity, Gamla Uppsala was long regarded throughout Northern Europe as an important and sacred location and was ultimately graced by palaces, a great pagan temple, and a royal burial ground. John Ljungkvist of Gamla Uppsala University says, "These rulers transformed the entire landscape to showcase what they thought was their divine lineage." He adds, "These monuments made Uppsala a central assembly place for nearly 1,000 years. It's* Beowulf, *for real." Today, of some 300 remaining funerary barrows, three mounds in particular, measuring between 29 and 32 feet in height, have special significance. Mythological sources identify them as belonging to the gods Thor, Odin, and Freyr, while legends state that the mounds held the remains of Ynglinga royalty. Excavations of one of the mounds began in 1846 at the instigation of the future king Karl XV (r. 1859–1872) in order to respond to what he saw as spurious claims that the mounds were simply natural landscape formations. Archaeologists, however, confirmed that there were funerary remains there, and in another of the three mounds, which was dug in 1874. All agree that the burials were princely.*

THE SITE

The three royal mounds at Gamla Uppsala are termed Eastern Mound, Middle Mound, and Western Mound. The first excavation, in 1846, was begun on the Eastern Mound by Bror Emil Hildebrand. There he discovered an urn holding burned bones and charred grave offerings. The grave, surprisingly, held the remains of a woman and a boy, cremated and interred according to fifth- and sixth-century Scandinavian practice. In 1874, the Western Mound was found to contain a man—likely a warrior, since military equipage was uncovered along with high-quality weaponry. Ivory game pieces and cameos unearthed in the burial suggest strong trade ties reaching as far as the Mediterranean. While the Middle Mound has, as yet, not been fully excavated, in the course of digs beginning in 2012 researchers have focused on the area encircling the mounds where dwellings, outbuildings, and a variety of artifacts from everyday life—and from all classes of society—are being uncovered.

Royal mounds, Gamla Uppsala

Gold and garnet pendant

WHILE YOU'RE THERE

The museum at Gamla Uppsala features archaeological finds from the site. A composite model and a timeline help place Gamla Uppsala and its eventful Nordic history in context. In the summer months, you can take a guided tour, or you can follow an app on your phone. Once you've worked up an appetite, head over to the Odinsborg restaurant right next to the museum.

–Malin Grunberg-Banyasz

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Metro construction, Rome

Mosaic floor and frescoed walls

WHILE YOU ARE WAITING

Authorities in Rome have approved a plan to build a metro station similar to underground "museums" in the metro systems of Naples, Athens, Porto, and Vienna. The Amba Aradam stop of the metro's new "C" line will be constructed near the Colosseum around an impressive second-century A.D. Roman barracks. The ruins, covering some 10,000 square feet, were found about 30 feet below street level as excavations for the station began. The ancient complex includes a 328-foot-long hallway with 39 rooms decorated with frescoed walls and black-and-white mosaic floors. According to Rossella Rea, scientific director of the archaeological excavation, the site was the garrison of the Praetorian Guard, an elite security force for Roman emperors. A grave containing 13 skeletons, most likely of soldiers, was also uncovered, along with a bronze coin and a bronze bracelet.

Barracks

"The barracks were abandoned and completely forgotten in the third century A.D., when the Aurelian Walls were built to protect Rome against attacks," says Rea. Now, after more than 1,700 years spent in oblivion, the garrison is poised to return to its original hustle and bustle—but not without precautions being taken. Project architect Paolo Desideri says, "The new line requires us to excavate to a depth of 130 feet, so the entire ancient Roman site will be moved and stored safely. Later, the barracks will be replaced at their original depth." Passengers catching a train will be able to see the barracks through a large glass window. Desideri explains that the Aurelian Walls will also be exposed, so commuters can have the same view that people had in antiquity.

—Rossella Lorenzi

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A DANGEROUS ISLAND

Tourists exploring Scotland's Isle of Eigg recently called police when they found human bones lying in a cave, possible remnants of the area's gruesome past. Legend holds that in 1577, nearly the entire MacDonald clan of the island was murdered by rival MacLeods from Skye as a result of a generations-long feud. The MacDonalds were hiding in the cave when they were discovered by a vengeful party of MacLeods, who, the story goes, blocked the entrance with vegetation and set it on fire. Almost 400 MacDonalds suffocated and died in what came to be known as *Uamh Fharaing*, or "Massacre Cave."

Following a trend set by Sir Walter Scott, who brought a skull from the cave back to his house at Abbotsford, curious travelers to Eigg during the eighteenth and nineteenth centuries occasionally carried off skeletal parts found in the cave as souvenirs, despite the fact that most of the bones were removed and buried in the island's graveyard after the massacre, says Camille Dressler of the Eigg History Society. Recently, though, natural disturbances in the soil exposed additional remains, and the criminal investigation team alerted by the modern tourists was able to retrieve 53 bones now known to belong to a single individual around 16 years old. According to radiocarbon results, the bones date to between 1430 and 1620, perhaps tying them to the notorious massacre. Historic Environment Scotland archaeologist Kirsty Owen plans to commission more radiocarbon dating, as well as isotopic analysis and possibly DNA work, in the hopes of narrowing the date range.

Massacre Cave, Eigg, Scotland

–Jason Urbanus

Palace Complex, El Palenque, Mexico

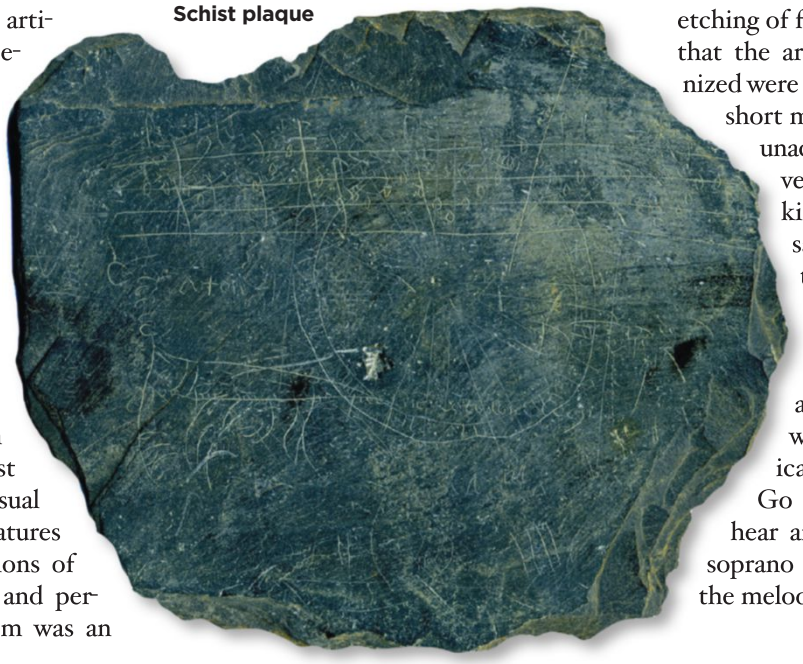
HOUSE RULES

The excavations of a royal palace complex within the site of El Palenque in Mexico's Oaxaca Valley may provide evidence for one of the earliest central governments in the Americas, according to archaeologists Elsa Redmond and Charles Spencer of the American Museum of Natural History. The complex dates to between 300 and 100 B.C. and contains a multiuse building with a sophisticated water management system, a grand private residence, dining facilities, rooms for official functions, and ritual spaces. Radiocarbon samples and ceramics confirm the dating of the palace to a time when states associated with the Zapotec civilization were emerging in the region. To guide the research, the team studied later colonial descriptions of Aztec royal palaces. "We would not expect all the architectural details of a late Postclassic or early colonial period Aztec palace in the basin of Mexico to be the same in prehistoric Zapotec palaces," Redmond says. "But there are some common aspects of a centralized, hierarchical, and differentiated state administration that might be present in all royal palaces of different time periods."

–Marley Brown

RENAISSANCE MELODY

Schist plaque



Seldom, if ever, do artifacts allow us to experience what people heard in the distant past. But a team excavating at the medieval Convent of the Jacobins in Rennes, France, recently made a discovery that brings to life a short snatch of a song that was last sung by monks in the sixteenth century. Beneath the convent's refectory, the team found a number of schist plaques inscribed with casual etchings, including caricatures of people, medieval versions of the game of hopscotch, and personal names. Among them was an etching of four lines of diamond shapes that the archaeologists quickly recognized were musical notes representing a short melody of a plainchant, or an unaccompanied sacred song. "It's very difficult to know just what kind of song the notes record," says Gaëtan Le Cloirec of the National Institute of Preventive Archaeological Research, who led the excavation. "It's probably a short religious song that was engraved by a Dominican monk as an exercise." Go to archaeology.org/chant to hear ancient music specialist and soprano Dominique Fontaine sing the melody.

–Eric A. Powell

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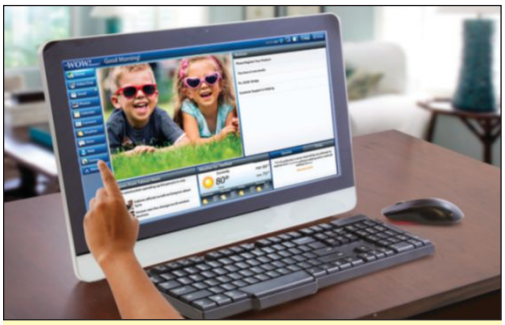

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TAKE ME OUT TO THE BALL GAME

Today, urban sports arenas are often surrounded by restaurants, bars, and souvenir shops where crowds of people gather before and after an event. New research outside the amphitheater in the Roman city of Carnuntum suggests that the same was true 2,000 years ago. Located east of Vienna, Carnuntum was once one of the largest cities in the Roman Empire, although much of it is unexcavated and hidden from view. Over the past several years, Austrian archaeologists have been using high-resolution magnetometers and ground-penetrating radar to analyze the ancient city's topography. A recent investigation detected an entire "entertainment district" surrounding Carnuntum's suburban amphitheater. The scans revealed that the street leading to the amphitheater from the city was lined with an array of inns, shops, bakeries, and Roman "fast food" restaurants (*thermopolia*) that would have catered to the large crowds attending gladiatorial contests.

–Jason Urbanus

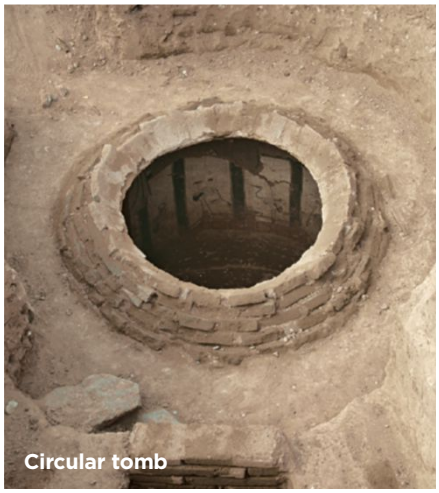
Digital rendering, Carnuntum, Austria

TOMB COUTURE

Mural, Datong, China

Archaeologists in the northern Chinese city of Datong have completed excavations of a circular tomb dating to the Liao Dynasty (A.D. 907–1125) believed to belong to a husband and wife. An urn with cremated human remains was found in the middle of the tomb. The tomb's walls feature four vividly colored mural panels that depict cranes, servants, and many articles of dress. The degree of preservation has impressed researchers. In the mural on the west wall, garments colored sky-blue, beige, bluish-gray, yellowish-brown, and pink hang from two clothing stands. One item has a green diamond pattern, with a small red flower that can still be made out at the middle of each diamond.

–Daniel Weiss


Circular tomb

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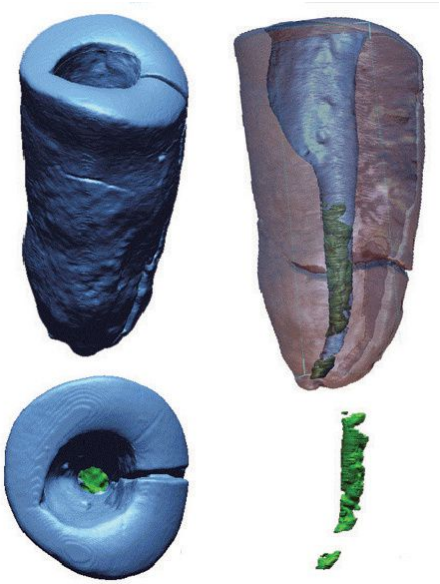
FROM THE TRENCHES

NOT SO PEARLY WHITES

Researchers working near Lucca in northern Italy have found the oldest example of the practice of filling dental cavities, according to Stefano Benazzi of the University of Bologna. Using microscopic techniques, Benazzi and his team determined that two 13,000-year-old front teeth that belonged to a late Pleistocene hunter-gatherer were manipulated with a handheld tool. The Ice Age dentist drilled to remove decaying material within the pulp chambers of the teeth and replaced it with a natural antiseptic paste containing bitumen, vegetal fibers, and hair. This new evidence suggests a more sophisticated technology than previous markings that Benazzi and his colleagues found in teeth from another site in Italy, dated a thousand years earlier. Those teeth are believed to be the first known evidence of human dentistry.



Digital rendering of front tooth

–Marley Brown

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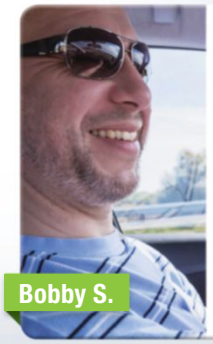

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LATE PALEOLITHIC MASTERPIECES

The people of the Paleolithic Magdalenian period in Spain and France created great works of figurative art such as the Lascaux cave paintings, which realistically depict a rich variety of wildlife. But scholars have long believed that around 14,000 years ago, that dramatic artistic tradition came to a sudden end. People of the succeeding Azilian period were thought to have completely stopped making animal figures, and instead focused their creative energies on etching and painting abstract designs on pebbles. But the recent discovery of 45 engraved stone tablets along with Early Azilian tools at a rock shelter in Brittany has shown that, in fact, some Azilian people carried on the artistic tradition of their Magdalenian ancestors.

University of Nice archaeologist Nicolas Naudinot led the team that unearthed the engravings and says they resemble elaborate Magdalenian depictions of horses and a kind of wild cattle known as an aurochs. One bull is even shown with rays emanating from its head, the only such example of a "shining" animal known in prehistoric European art. Naudinot says the rays were added some time after the original head was carved, because the bull's horns were reengraved over the lines. "The prehistoric people wanted the rays to be in the background," says Naudinot, who speculates they could be a rendering of the sun, or perhaps they were simply symbolic abstractions, similar to the ones later Azilian people would carve on pebbles.

–Eric A. Powell

Engraved stone tablets

AFTERLIFE ON THE NILE

Wood coffin, Qubbet el-Hawa, Egypt

The intact tomb of a member of a powerful Egyptian family, dating to the nineteenth century B.C., has been discovered by the Spanish Archaeological Mission at Qubbet el-Hawa, across the Nile from Aswan. The burial's outer coffin is severely damaged, most likely by termites, but the inner coffin is in fine condition. Made of Lebanese cedar, it bears the name of the deceased—Shemai—as well as those of his mother and father. Both Shemai's father, Khema, and his eldest brother, Sarenput II, served as regional governors during Egypt's 12th Dynasty.

The tomb also contains six wooden models representing scenes of daily life and wooden boats thought to have been involved in the funerary trip of the deceased. "This kind of discovery is uncommon in Egyptian archaeology today," says Alejandro Jiménez-Serrano of the University of Jaén. "We have been able to record and document the whole funerary structure."

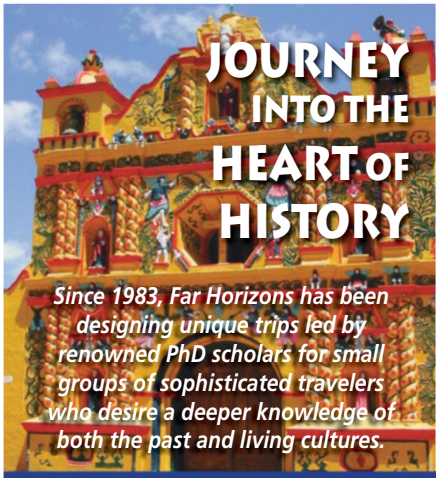
–Daniel Weiss

KNIGHT WATCH

Archaeologists and conservators from Jamestown Rediscovery have begun to analyze a tombstone that has lain within iterations of the church at Jamestown for centuries. They believe the stone, which features the silhouette of a knight, belongs to Sir George Yeardley, a three-time colonial governor of Virginia, who died in 1627. Originally found in 1901 by the Association for the Preservation of Virginia Antiquities, the tombstone was broken into multiple pieces and is missing original monumental brasses that could definitively identify the deceased. However, the claim that it is Yeardley is bolstered by evidence from the will of a relative, Adam Thorowgood, which dates to 1680. Hayden Bassett, assistant curator, says that Thorowgood's will states that he would like to have a tombstone of marble set forth with the coat of arms of Sir George Yeardley and himself, with the same inscription as on the broken tomb. "We believe that might be a reference to this particular tomb," adds Bassett. According to Mary Anna Richardson, staff archaeologist, and William Kelso, director of research and interpretation, efforts to analyze Yeardley's tombstone will be followed by an archaeological survey of the church's chancel, slated for fall 2017, in the hope of uncovering Yeardley's actual remains. An exhibit marking the 400th anniversary of the first representative assembly meeting in Virginia, which began in 1619 under Yeardley's governorship, is planned for 2019.

–Marley Brown

Limestone tombstone



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THE GRAND ARMY DIET

In 2001, construction in Vilnius, Lithuania, revealed a mass grave of more than 1,000 soldiers and camp followers of Napoleon's Grand Army who perished during the emperor's disastrous 1812 retreat from Russia. Hundreds of thousands of men—and women—froze to death or succumbed to disease and starvation on the march.

Mass grave excavation, Vilnius, Lithuania

Regimental insignia

Now the remains, recovered by a team of French and Lithuanian archaeologists, are the subject of a study, led by anthropologist Sammantha Holder of the University of Georgia, to determine the diets of those who died both before and during the events of 1812. Using stable isotope analysis, Holder and her colleagues have found diverse diets among the 78 individuals she analyzed. The soldiers in the Grand Army came from all over Europe and were stratified by status and rank, so Holder is not surprised that individual diets varied considerably.

As for the period at the end of their lives, there is more research to be done. "My collaborators and I are building on the findings of this study by reconstructing diet closer to death, employing additional biochemical methods, and incorporating historical evidence," Holder says. "One of the goals of our future research is to see if we can detect inadequate protein consumption in the skeletons of these individuals."

–Marley Brown

ANGRY BIRDS

Macaw skeletons found at Ancestral Pueblo sites in the American Southwest exhibit signs of having had their feathers removed by humans, according to a new study by zooarchaeologist Randee Fladeboe of the University of Florida. Fladeboe has examined the bones of macaws dating to between A.D. 950 and 1400 discovered at Pueblo Bonito, Pueblo Arroyo, and Pecos Pueblo, all in New Mexico. She's finding evidence that the birds were not only plucked, but had been raised for that purpose. Macaw feathers held great ritual and political value for Puebloan people in the region, but it is doubtful these communities bred macaws from birth. "The general theory accepted by archaeologists is that the birds were bred at sites farther south and brought north as juveniles," says Fladeboe, who explains that keeping these notoriously stress-prone tropical birds in a desert environment would have required intensive daily effort. She continues, "Human-macaw relations in this time and place involved a vast network of material and social resources that we have only just begun to investigate."

Scarlet macaw

–Marley Brown

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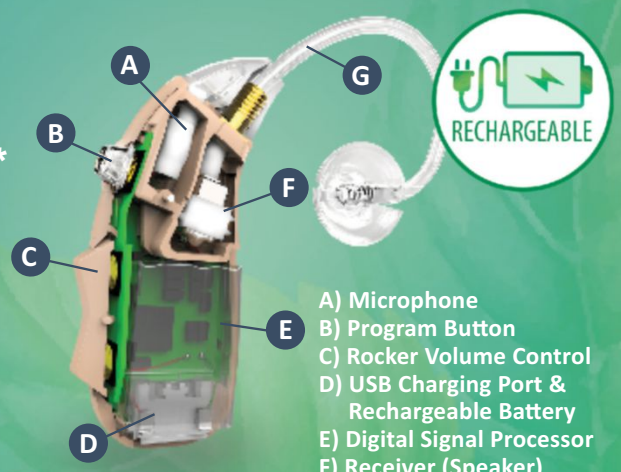

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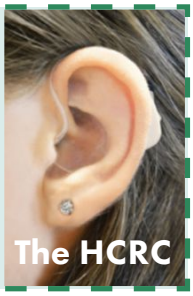

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WORLD ROUNDUP BY JASON URBANUS

CANADA: Excavations on Triquet Island off the British Columbian coast may affirm the generations-old oral histories of the Heiltsuk Nation. Their tradition holds that tribal ancestors once sought refuge on an unfrozen strip of land along the coast to survive the last Ice Age. Radiocarbon dating of charcoal found in a hearth indicates that human settlement on the island dates back, surprisingly, some 14,000 years, when most of Canada was covered in glaciers. The site also holds evidence of stone tool manufacture and sea mammal hunting.

PORTUGAL: A 400,000-year-old partial skull buried in the Gruta da Aroeira cave in central Portugal is the oldest human fossil ever found in Portugal and the westernmost in Europe dating to the Middle Pleistocene. The deposit in which the cranium was embedded also contains stone tools, faunal remains, and burned bones. Because the skull displays a unique combination of physical characteristics, experts are hoping it can provide important new information about human evolution in Europe and the origins of Neanderthals.

IRELAND: A previously unknown early medieval ringfort measuring 130 feet in diameter was discovered near Roscommon during a road construction project. Occupied between the 6th and 11th centuries, it served a variety of purposes over that time. Initially, it was likely home to a prominent family, but was later transformed into a jewelry workshop, an animal enclosure, and a cemetery when the original inhabitants expanded their settlement into the surrounding countryside. Around 800 burials were also identified, including 470 belonging to juveniles and infants.

ALGERIA: Nearly 2,000 years of Algerian history is being exposed during ongoing construction of a new metro station in Martyrs Square in Algiers. Although authorities knew the site was located near the Roman port of Icosium, they were overwhelmed by the trove of artifacts, mosaics, and infrastructure belonging to the Byzantine, Ottoman, and French colonial periods. The 32,000-square-foot site was deemed so significant that the government has now adapted their plans for the metro line in order to accommodate and preserve it.

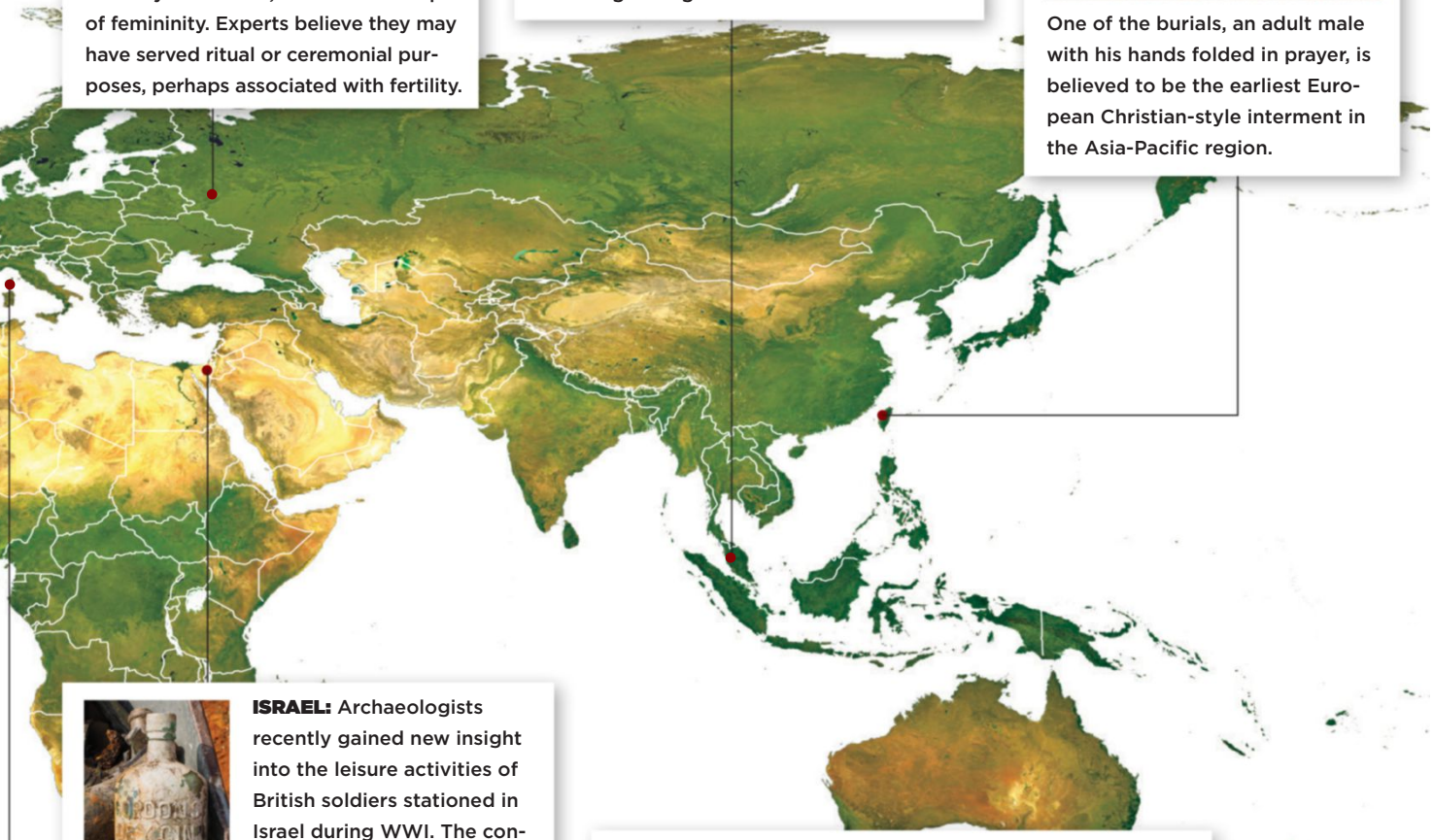
CORSICA: A sanctuary dedicated to the god Mithras has been excavated at the Roman site of Mariana. Within the multiroom complex archaeologists have recovered parts of the customary relief sculpture depicting the god slaying a sacred bull, as well as bronze bells, oil lamps, and other ceramics used during religious ceremonies. Mithraism was a mystery religion that was introduced to Rome from the East and gained popularity in the late first century A.D., especially with the Roman military.

RUSSIA: An extraordinary 23,000-year-old figurine was unearthed in the Bryansk region of western Russia alongside stone tools, painted mammoth bones, and bison remains. The tiny two-inch statuette is carved from mammoth tusk and represents a possibly pregnant woman, rendered with exaggerated proportions. She is one of only a few existing small Paleolithic sculptures known as Venus figurines, thought to embody an ancient, idealized concept of femininity. Experts believe they may have served ritual or ceremonial purposes, perhaps associated with fertility.

MALAYSIA: An area that was once part of the moat that surrounded Fort Cornwallis in George Town proved to contain an array of artifacts dating back to the colonial era, including coins, porcelain, ceramics, plates, and glasses. The fort was originally built in 1793 at the behest of the British East India Company, and the moat was added in 1804 for extra security against a possible French attack. It was filled in during the 1920s to curb mosquito breeding during a malaria outbreak.

TAIWAN: Until recently, little was known about the Spanish colony of San Salvador de Isla Hermosa, which was founded on Heping Dao in 1626. However, current work is finally exposing parts of the early settlement, including the foundations of a church or convent and an adjacent cemetery.

One of the burials, an adult male with his hands folded in prayer, is believed to be the earliest European Christian-style interment in the Asia-Pacific region.



ISRAEL: Archaeologists recently gained new insight into the leisure activities of British soldiers stationed in Israel during WWI. The construction of a highway near Ramla uncovered a former British military barracks, which contained thousands of discarded objects dating to the period. As expected, military paraphernalia and other reflections of soldierly life were found, but workers also came across hundreds of glass liquor bottles that once held wine, beer, whiskey, and gin that had been imported from Europe to supply the troops.

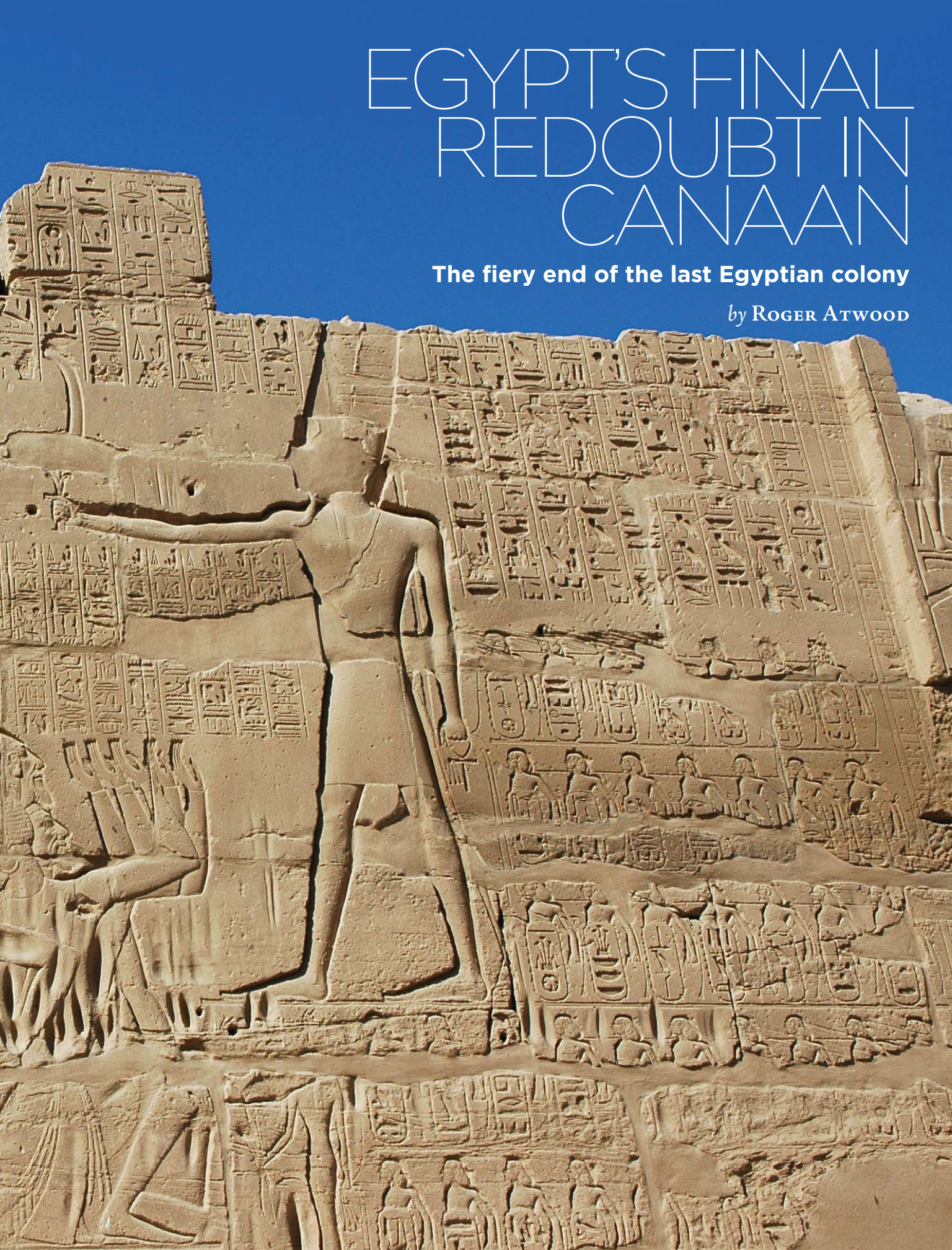
NEW ZEALAND: The site of a future convention center in Christchurch is shedding light on the lives of the city's first European settlers. Apparently, even back then, men were concerned with hair loss. Among the hundreds of artifacts found at the site in rubbish pits and deposits dating to the mid-19th century was a container of Russian Bears Grease. The quirky pharmaceutical product purportedly aided hair growth and prevented baldness—the underlying theory being that because bears were hairy, their fat could stimulate hair growth for humans.

A sandstone relief on the Seventh Pylon at the temple of Amun-Ra at Karnak shows the pharaoh Thutmose III, the Egyptian ruler who conquered Canaan, massacring his enemies.

EGYPT'S FINAL REDOUBT IN CANAAN

The fiery end of the last Egyptian colony

by Roger Atwood



Wealthy Canaanites adopted many Egyptian customs and decorative motifs, such as clay coffins (left) dating to the 13th century B.C. from Deir el-Balah in Gaza and the Eye of Horus (below) such as this faience one found at Jaffa in Israel.

For three centuries, Egyptians ruled the land of Canaan. Armies of chariots and 10,000 foot soldiers under the pharaoh Thutmose III thundered through Gaza and defeated a coalition of Canaanite chiefdoms at Megiddo, in what is now northern Israel, in 1458 B.C. The Egyptians then built fortresses, mansions, and agricultural estates from Gaza to Galilee, taking Canaan's finest products—copper from Dead Sea mines, cedar from Lebanon, olive oil and wine from the Mediterranean coast, along with untold numbers of slaves and concubines—and sending them overland and across the Mediterranean and Red Seas to Egypt to please its elites.

As with many colonial ventures before and since, military conquest led to a new cultural order in the occupied lands. Across Israel, archaeologists have found evidence that Canaanites took to Egyptian customs. They created items worthy of tombs on the Nile, including clay coffins modeled with human faces and burial goods such as faience necklaces and decorated pots. They also adopted Egyptian imagery such as sphinxes and scarabs. For the Egyptians, Canaan was a major trophy. Artists in Egypt carved and painted narratives on the stone walls of temples boasting about vanquished subjects and depicting Canaanite prisoners naked and bound at the wrists.

Yet Egypt's presence in Canaan ended sooner than the pharaohs might have expected. With Canaan under assault from seaborne invaders and hit by drought so severe it caused food shortages, Egypt's colonial rule began to crumble around 1200 B.C., starting in the north and gradually spreading south. Egypt did not fall alone. The eastern Mediterranean's two other great powers of the day, the Hittites in central Turkey and the Mycenaeans in Greece, saw their capitals sacked and their governments fail. They all toppled in the pan-Mediterranean Late Bronze Age collapse of the twelfth century B.C. Egypt's 2,000-year-old dynastic system survived, but it lost its trade ties throughout the Mediterranean and its valuable outposts in Canaan.

The beginning of Egyptian rule in Canaan, with that smashing victory at Megiddo, is much clearer than its end. Archaeologists digging the remains of Egyptian sites in Israel and combing through ancient texts carved into temple walls and scratched onto clay tablets have never been able to pinpoint exactly when, or even how, Egypt's occupation of Canaan expired. Did it decline slowly or end suddenly? Was it an orderly withdrawal or a messy rout? Did it fall in the region-wide cataclysm of the Late Bronze Age or were local factors more to blame?

At the port of Jaffa, on Tel Aviv's south side, archaeologists Aaron Burke of the University of California, Los Angeles, and Martin Peilstöcker of Johannes Gutenberg University of Mainz are finding that the fall of Egypt's rule came the way Hemingway famously described bankruptcy—gradually, and then suddenly—and was at least partly due to homegrown factors. The Egyptian outpost at Jaffa had an uneasy relationship with the locals, and it apparently met a fiery end. Burke and Peilstöcker have found evidence of two catastrophic blazes, ten years apart, that destroyed Jaffa, the second one occurring in about 1125 B.C. That fire, Burke believes, marked the end of Egypt's presence not just in Jaffa, but in all of Canaan. "Jaffa was the only Egyptian outpost that was purely military. This was their last line of defense, and once it fell, any remaining Egyptian centers in Canaan would have been cut off from Egypt," says Burke. He has been excavating the site since 2007, following on digs starting in the 1950s that revealed Jaffa as a walled enclave of pharaonic power whose strained relationship with the surrounding people stood in sharp contrast to the cultural affinity between Egyptians and Canaanites elsewhere. Burke says, "They lived largely at odds with each other. And after the Egyptians left, there is no further trace of their presence here."

Excavations in Jaffa reveal the floor of an ancient Egyptian garrison next to a modern replica of the gate that bore an inscription to the pharaoh Ramesses II.

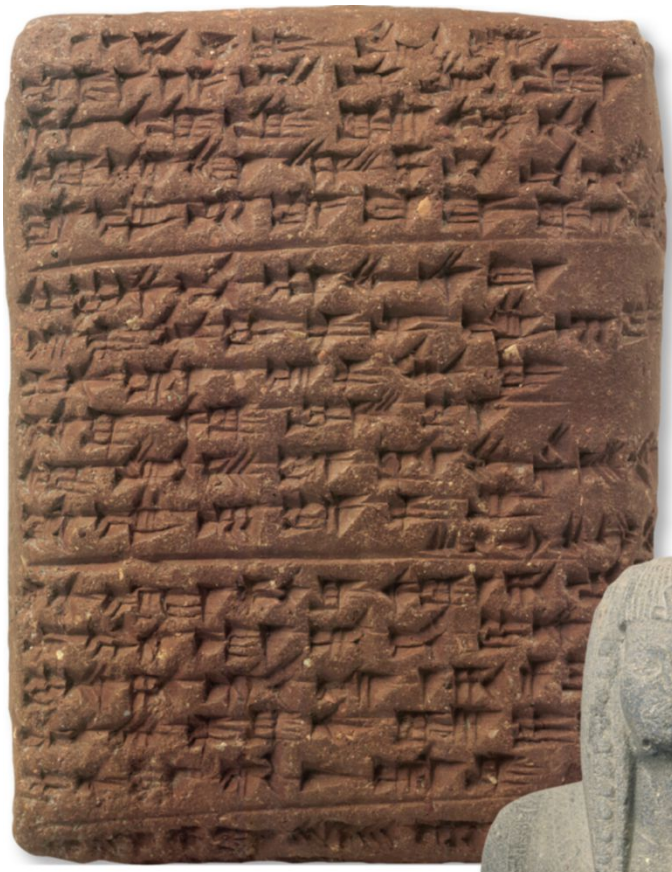
Separated by the Sinai, a bleak and sparsely populated land in antiquity as now, Egypt and Canaan were neighbors whose histories of war, trade, and migration intersected and intertwined over millennia. Egypt's powerful centralized government ruled along the Nile, where pharaohs built the pyramids of Giza and reigned like gods over people who worshipped them. In contrast, Canaan was a land of warring city-states and hill tribes, spread out over what are now Israel, Lebanon, southwestern Syria, and the West Bank. At Canaan's peak, there were about 20 such city-states in the southern area alone. Their culture was rustic, their power decentralized and weak.

Canaan had great mineral and agricultural wealth—and the Egyptians coveted it. As early as the third millennium B.C., the Egyptians established busy trading posts in the coastal city of Ashkelon and in Gezer in the center of the region to buy up exotic products and transport them to Egypt on donkeys, which had only recently been domesticated. A few centuries later, the Egyptians began trading by ship with the seaport of Byblos on the coast of modern Lebanon, bypassing southern Canaan, whose ties with Egypt languished. Over time, Canaan's states strengthened and, around 1700 B.C., they invaded northern Egypt with a devastating innovation—the horse-drawn chariot—followed by settlers who built cities in the marshy Nile Delta. Known as the Hyksos, a Greek version of an Egyptian phrase that meant "foreign rulers," they maintained their cultural habits and clashed with Egyptian rule to the south. Ultimately, the Egyptian state, reunified under the pharaoh Ahmose (r. 1550–1525 B.C.), expelled the Hyksos and sent them back to their homeland around 1540 B.C.

A century later, newly self-confident and thirsty for expansion, the Egyptians found the right agent for their ambitions in Thutmose III (r. 1479–1425 B.C.). His lithe, commanding figure can still be seen today smiting Canaanite masses in temple carvings in the old dynastic capital of Luxor. To the south, Nubia fell under Egypt's military might, too. "Egypt now saw itself as the center of the universe, and all its neighbors were considered enemies and targets for invasion," says Daphna Ben-Tor, former curator of Egyptian archaeology at the Israel Museum in Jerusalem. Egypt was at the threshold of the New Kingdom (1550–1070 B.C.), the artistic golden age of Hatshepsut, Akhenaten, and Tutankhamun. "As it became richer and reunified," Ben-Tor says, "its appetite grew for the kinds of high-status goods that Canaan offered, such as copper, turquoise, and high-quality wood."

There were other objectives as well. Ruling Canaan allowed Egypt to check the expansion of the Hittite Empire and gave it control over trade routes from central Asia to the Mediterranean. "Egypt's reason for being in Canaan was, first, strategic," says archaeologist Israel Finkelstein of Tel Aviv University.

A fragment of a painted limestone relief dating to about 1400 B.C. from Thebes in Egypt depicts defeated Canaanites.



One of the 382 clay tablets (above) known as the Amarna Letters found at the site of Amarna in Egypt contains a letter from the Canaanite ruler Aziru to the pharaoh Amenhotep III. A statue (right) of the pharaoh Ramesses III found at the Canaanite site of Beth Shean.

"Canaan was important as a bridge to the north and the international routes to ports on the Mediterranean. Egypt could also exploit Canaan's agricultural output," he says. "The Egyptians imposed their rule and brought a certain stability while they exploited the land. Look at other empires through history—British, Roman—and you have that same balance of stability with exploitation." Canaan's rulers became vassals of the Egyptian state.

Once in charge, the Egyptians set up a colonial administration in Canaan whose inner workings are well documented. The main source of information is the Amarna Letters, an archive of 382 clay tablets unearthed in the ancient Egyptian city of Amarna over several years around 1900. Written in Akkadian cuneiform, the diplomatic lingua franca of the day, the letters give a rich sense of how abjectly the Canaanite chieftains obeyed the Egyptian ruler and how they jockeyed for his favor. About 300 of the tablets were addressed directly to the pharaoh. One, written by the ruler of the city of Shechem to Amenhotep III, starts with the Canaanite vassal declaring himself "your servant and the dirt on which you tread. I fall at the feet of the king, my lord and my sun." He then offers to send his own wife to the pharaoh if asked. In another letter, the ruler of Jerusalem frantically defends himself against accusations of disloyalty lodged by the leader of a rival city-state. In yet another, the king of Babylon demands justice for the murder of a Babylonian messenger who was crossing Canaan on his way to Egypt. "Canaan is your country, and its kings are your servants," wrote the Babylonian. He enclosed a sapphire with the letter, to smooth tensions. Other letters relate more mundane business, such as details of food shipments or deliveries of horses.

The Egyptian colonists imported or re-created all the visual propaganda of their power, with objects expressing the permanence of their empire. At the site of Beth Shean, near the Sea of Galilee, a life-size basalt figure of a seated Ramesses III presided over the entrance to one of the main temples. Excavated in the early twentieth century by University of Pennsylvania Museum archaeologists and now in the Israel Museum, the statue was carved from locally quarried stone by imported Egyptian artisans. Beth Shean was occupied mostly by Egyptian soldiers, scribes, and colonial bureaucrats, but, at other sites, ordinary Canaanites would have seen similar political statements. At Hazor, one of ancient Canaan's largest cities, a team from the Hebrew University of Jerusalem recently found part of a sphinx made of gneiss, a valuable stone used by the Egyptians for statues of gods and rulers. The sphinx bears an inscription to Menkaure (r. 2490–2472 B.C.), a pharaoh who was originally interred in one of Giza's pyramids. Yet the layer of the excavation in Hazor where the statue was found dates from centuries later in the mid-second millennium B.C. The sphinx had probably been imported from Egypt to lend status to a temple, a relic from the old days meant to lend prestige to Egypt's new colony.

Egypt's power wasn't felt only in mighty sculptures. It also wielded a strong cultural pull on Canaan's elite, who were attracted to Egypt's graceful jewelry and symbols. Archaeologists have found hundreds of Egyptian-style objects in Canaanite burials, including alabaster, glass, and carnelian jewelry, scarabs decorated with sphinxes and hieroglyphs, and clay pots. Wealthy Canaanites liked to stock their tombs with imitations of Egyptian *ushabti*, figurines of

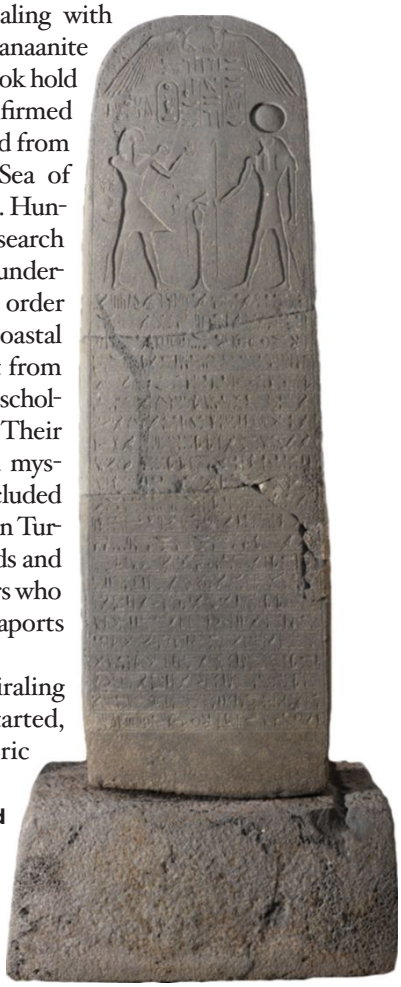
people who would tend to the dead in the afterlife. "There was an Egyptianization, so to speak, of Canaan's material culture," says Ben-Tor. "The Canaanites were burying their dead with objects imported from Egypt or with local imitations of them."

Sometimes the Canaanites added their own twists to Egyptian customs. About 130 clay coffins, some decorated with naturalistic human faces, have been excavated near Beth Shean and Gaza, another center of Egyptian control. Such caskets were commonly used in Egypt, but in Canaan they were filled not just with Egyptian-style mortuary goods, but also Canaanite items. Sometimes two people were buried in a single coffin, which was unheard of in Egypt but a common practice in Canaan.

Along with adopting Egyptian burial practices, or their version of them, the Canaanites also came to worship the Egyptian goddess Hathor. She was associated with love, music, and a kind of feminine grace that Egyptians and Canaanites alike admired, and was the only Egyptian deity absorbed into the Canaanite pantheon. Her distinctive look, with almond-shaped eyes, long curls, and the ears of a cow, appears on objects both plain and fine and in archaeological contexts ranging from houses to palaces.

For a time, Egypt's power and cultural influence ran deep. But it was not to last. After Ramesses III (r. 1183–1153 B.C.) died, a line of much weaker rulers came to power—all named Ramesses and all incapable of dealing with the increasingly restive Canaanite masses. Severe drought took hold around 1200 B.C., confirmed recently by dates obtained from sediment levels in the Sea of Galilee and the Dead Sea. Hungry people migrated in search of reliable food sources, undermining the established order throughout the region. Coastal cities came under assault from marauders contemporary scholars call the Sea Peoples. Their exact identity remains a mystery, but they likely included people from southwestern Turkey and the Aegean islands and were opportunistic raiders who burned and pillaged seaports and inland cities.

"Canaan was in a spiraling collapse that, once it started, fed off itself," says Eric Cline of George Washington University. "The invasion of the Sea Peoples was one factor, but there was drought and with it came famine." Even before Ramesses III's rule, loyal Canaanite lords had warned in their letters to the pharaoh of uprisings and plots by rival states, and archaeological evidence suggests insurrection swept the Canaanite interior. By 1130 B.C., people had burned down the Egyptian ruling compounds in Megiddo, Lachish, and at least a dozen other cities. At some, up to 15 feet of ash have been discovered. Finally, the spreading revolt reached Jaffa.



A basalt stele excavated at Beth Shean depicts the victory of the pharaoh Seti I, who reasserted Egyptian rule over Canaan in the 13th century B.C.

The goddess Hathor (top) was the only Egyptian deity worshipped by the Canaanites. The capture of Joppa (Jaffa) by Thutmose III's general Djehuti is recounted on a papyrus (above) found in Egypt in the late 19th century.

BUILT ON A HILLTOP overlooking the sea, Jaffa's history of settlement stretches back more than 5,000 years. Its modern seaport, filled with fishing dinghies and yachts, faces the Mediterranean on the hill's western side. But in antiquity the port was on the opposite side, east of the city, up a marshy estuary that protected ships from storms and impeded access to the city over land. Egypt captured Jaffa during Thutmose III's first wave of conquest, a victory described in a tale called the "Taking of Joppa" (Joppa being an old name for Jaffa) that appears on a papyrus discovered in Egypt around

The gate into Jaffa (top), shown here in a digital reconstruction, led to a covered passageway where Canaanite farmers brought their crops. Excavations (above) have uncovered burned seeds, as well as a collapsed roof, evidence of the fire that destroyed the Egyptian garrison.

1870, now in the British Museum. The story goes that the Egyptian commander Djehuti feigned surrender after being rebuffed in his attempt to take Jaffa. He then offered 200 baskets as tribute to the Canaanites. Concealed in the baskets were Egyptian soldiers who, once inside the city, leapt out and conquered it.

Canaanites elsewhere may have warmed to Egyptian rule, but not in Jaffa. It was a foreign outpost in an often hostile land, says Burke. The absence of Canaanite materials from the Egyptian period inside the city's walls attests to the strained relationship between the two communities, he believes. "We can reconstruct the whole hierarchy of Egyptian control here: the way the city gained a military foothold, reached its height during the time of Ramesses II, and then was abandoned, and in almost all that time it was isolated from the surrounding Canaanite culture"—so isolated, in fact, that elite Egyptian men brought their wives, he says, suggesting colonial officers spurned local women. "The lower ranks may have married local girls." The Egyptians wouldn't even bury their dead in this foreign land. Burke has found no Egyptian graves in Jaffa because, he believes, Egyptian corpses were sent home for burial. The Egyptians imported their own ceramics and even delicacies such as Nile perch, a few bones of which have been found.

In Egyptian times, anyone entering Jaffa passed under an imposing square gate made of two mudbrick towers joined on top by a wide, two-story wooden bridge that formed a covered passageway. American archaeologist Jacob Kaplan excavated fragments of the gate's monumental facade around 1960. He found less than half its decorative elements, but enough remained to discern the gate's carved invocation to Egypt's—and now Canaan's—absolute ruler: "Horus-Falcon, Strong Bull, Beloved of Maat, King of Upper and Lower Egypt, Usermaatre Setepenre, Son of Re, Lord of Crowns, Ramesses." Burke says, "This gate said to everyone who came, 'This is Egypt.'"

Burke and Peilstöcker have revealed a city of soldiers and Egyptian transplants, living on grains and fruits brought by Canaanite farmers to the Ramesses gate. Kaplan had uncovered 22 brewing pots, identical to those that appear in Egyptian wall paintings, showing that the soldiers brewed their own beer. They also had mementos from home, including several scarabs depicting Amenhotep III. Other finds, such as large Cypriot storage jars and fragments of Mycenaean vessels, point to the city's cosmopolitan trade ties. But hardly any local wares have been found. "Given the lack of Canaanite objects inside the city walls, and the fires that destroyed it, it's safe to say the Egyptians didn't get along with the people living nearby," says Peilstöcker. "If you just followed the biblical texts, you would think this was a very peaceful period, that the Egyptians

Archaeologists have unearthed numerous weapons, including these arrowheads, which have allowed them to reconstruct Jaffa's final, tumultuous moments.

The ruins of a 500-year-old Ottoman fortress stand on the site of Aphek, a few miles east of Jaffa. Aphek likely supplied much of the grain that fed Jaffa's Egyptian soldiers. The city also burned in the civil unrest that destroyed the garrison there.

were kind overlords. We find violence and upheaval."

The revolt that Burke believes ended Egypt's rule in Jaffa started about 1135 B.C., when the Ramesses gate burned down. It was rebuilt, but burned again some 10 years later. Burke believes the intensity of the heat from both fires shows that they were deliberately set.

In the second blaze, mudbricks facing the covered passageway were singed with such heat that they turned a reddish brown, as if fired in a kiln. Ceramics burned to ash. Fragments of antlers belonging to 32 deer that decorated the passageway were partly melted. Passengers aboard ships in the Mediterranean would have seen billows of black smoke as Jaffa's wood-and-thatch roofs blazed. According to Burke, the circumstantial evidence suggests that Canaanites set the fire themselves. He says, "Could it have been Sea Peoples? Maybe. But the dates we found are 50 years after destructions associated with them."

Burke and Peilstöcker have been able to reconstruct roughly how Jaffa's final insurrection transpired. The team has recovered bent arrowheads, a spearhead, and a lead weight inside the Ramesses gate, where the fighting must have broken out. They think that the attackers then set fire to the wooden platform between the two towers. It collapsed into the passageway below, on top of piles of seeds, olives, pistachios, lentils, dates, grapes, and wheat. Radiocarbon dating of 21 scorched seeds shows that the fire happened between 1134 and 1115 B.C., with the highest probability falling at 1125 B.C. Burke says that this is the latest confirmed date of Egyptian settlement in Canaan. Yet some scholars are skeptical it all ended in Jaffa.

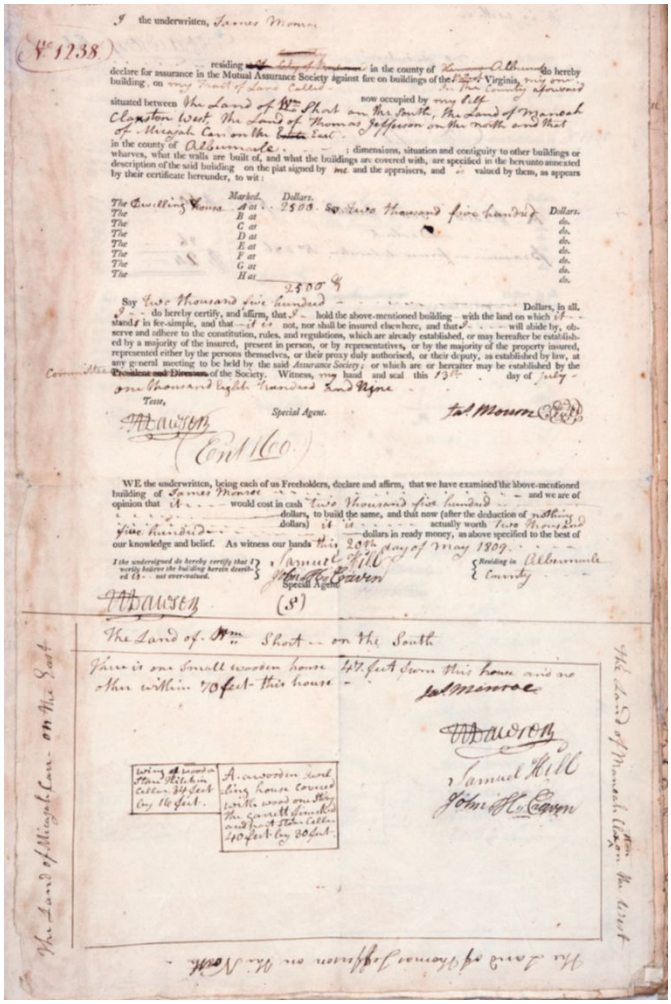
Into the beginning of the next century, there would be an Egyptian presence in Beth Shean, says Ben-Tor. "Jaffa wasn't the last Egyptian center," she says, "although it fell around the same time as the others." In any case, nearby Egyptian outposts also experienced fiery ends. Twelve miles inland from Jaffa stood the granary estate of Aphek, where today stand the ruins of a sixteenth-century Ottoman fortress. Excavations in the 1970s by archaeologists from Tel Aviv University found the granary buried under six feet of charred timbers and debris. Aphek's destruction suggests that the torching of Jaffa was not an isolated attack, but rather a component part of a general insurrection. Burke surmises it probably disrupted Jaffa's grain supplies, making the Egyptians' position that much more precarious. In 1125 B.C., the sight, from Jaffa, of smoke rising from Aphek would have made clear that Egypt's rule in Canaan was over. ■

Roger Atwood ***is a contributing editor at*** **ARCHAEOLOGY.**

A Residence Fit for a President

New evidence revises a long-held belief about James Monroe's home

by Traci Watson



For decades this modest white cottage (left) at Highland, the estate of President James Monroe, was thought to be his family residence. Monroe purchased this $2,500 insurance policy (above) for Highland in 1809.

While visitors to the homes of Thomas Jefferson and George Washington are escorted through fine mansions, tourists coming to the Albemarle County, Virginia, home of President James Monroe see a cottage. The modest clapboard house, located on the bucolic estate Monroe called Highland, was billed for more than a century as his family's main residence for much of his presidency.

To some visitors, the cottage may well have seemed commonplace, and a bit small for the home of a prominent family, headed by a man who stood roughly six feet tall. But for decades, few questions arose. Perhaps that was because Monroe—a Founding Father who fought in the Revolutionary War, a statesman who helped negotiate the Louisiana Purchase, and an enormously popular two-term president—is often perceived as a man of humble origins. His father had been apprenticed to a carpenter, and Monroe has been described as a woodworker's son and "farm boy" on a "second-tier Virginia farm." A nineteenth-century etching of Monroe's boyhood home shows what, to modern eyes, looks like a rough-hewn cabin, reinforcing the impression.

Currently, though, Highland's cottage is turning out to be a lesson in how a small misunderstanding—or deception—becomes a big one. "Much of colonial history—and the history of buildings—is like plaque building up in your arteries. It just hardens and hardens," says architectural historian Carl Lounsbury, who worked for decades at Virginia's Colonial Williamsburg, the eighteenth-century living-history museum. "And sometimes you've got to scrape it all away."

An 1816 portrait of Monroe by John Vanderlyn

In 1793, Monroe purchased land just down the road from Monticello, the home of his mentor Thomas Jefferson, who had urged friends to form a "society to our taste" in the countryside. Hoping to earn an income from farming, Monroe moved his wife, Elizabeth, and two children to the Highland property at the end of the eighteenth century. His political career often took him elsewhere, and Monroe doesn't seem to have formed a deep attachment to the place. "There wasn't this 'I can't wait to get back to Highland' sense in his writing that you see with Jefferson and Monticello," says architectural historian James Wooton, the former curator of Highland. Nevertheless, Monroe and his family called Highland home from 1799 to 1823. Seeking to pay off debts, he sold the core of the property in 1826. The last private owner bequeathed the estate to its present owner, the College of William & Mary, in 1974.

Today Highland is dominated not by the cottage, but by an 1870s residence built by an obscure Baptist minister, the Reverend John Massey. The hulking house overshadows both the cottage and a squat wing, sometimes called the "connector," that links the two into a single rambling structure. The complex edifice and complicated history perplexed archaeologist Sara Bon-Harper, who became executive director at Highland in 2012. "I didn't quite understand this building," Bon-Harper recalls. She soon turned to a technique close to her heart. "I'm an archaeologist," she says. "So many problems get solved with a shovel."

No one knows how and when locals began to believe the cottage was Monroe's house. An 1885 newspaper article notes that despite an earlier fire, "There remains yet in use a wing of the President's home." Monroe himself may have contributed to the misunderstanding by referring in a letter to his Highland house as his "cabin-castle," suggesting something diminutive and homespun. Even documents from Monroe's day seemed to confirm that he had lived in the cottage. Drawings in insurance papers held by Monroe show a house with a smaller kitchen wing and a larger dwelling wing. The existing cottage, coincidentally, is roughly the same size as the kitchen wing. "The dimensions, if you squint, fit pretty well," says Bon-Harper. "So it was not unreasonable to think the cottage was the smaller of the two wings."

Still, some pieces of the puzzle didn't seem to fit, among them the connector. Supposedly, it was built after much of the house was destroyed in the fire, atop a surviving fragment of foundation. "[That was an explanation] I couldn't quite get my mind around," Bon-Harper says. Then there were the observations Christopher Owens, a restoration craftsman based in Orange, Virginia, shared with Bon-Harper. He'd noticed that the wall between the connector and the cottage was actually two walls thick. This suggested that the cottage had originally been a freestanding structure and that the connector had been added later.

Bon-Harper began to wonder whether the cottage was Monroe's house at all. Perhaps it was the "new house" that Monroe mentioned in an 1818 letter to his son-in-law. In that letter, held in the James Monroe Museum and Memorial Library in Fredericksburg, Monroe writes that the structure is for lodgers. Another letter shows that Monroe and his family moved into their house at Highland at the end of 1799. At Bon-Harper's request, outside experts combed through the cottage and came to an unsettling conclusion: Everything in the cottage dates to the decades after 1800. The nails, for example, had been made with a technique common from 1805 to 1820. In the rafters of the connector, architectural historians found marks left by a circular saw, a tool used only after 1850. Next came an expert in dendrochronology, a technique for dating wooden timbers based on tree-ring measurements. The results show timbers used in the cottage had been made from trees harvested between 1815 and 1818. The dating, Bon-Harper says, was "not refutable." Where, then, was Monroe's actual house?

These nails excavated at Highland help confirm that the original structure dates to the late 18th century.

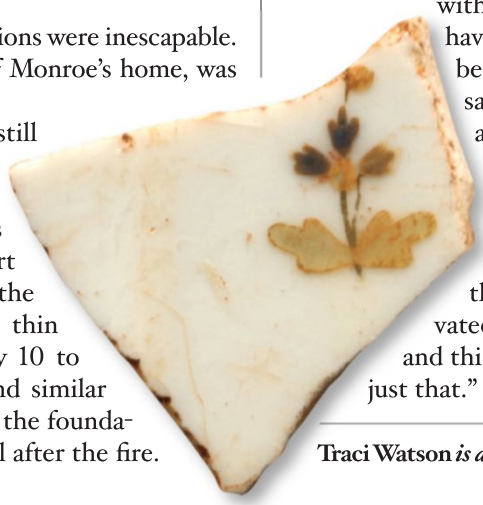
In 2014, a team led by Benjamin Ford of Rivanna Archaeological Services, a Charlottesville consulting firm, dug more than 200 round holes circling the buildings, each roughly 1.5 feet in diameter and reaching down to the subsoil. All of the holes dug in the boxwood-lined formal garden of the Massey House produced brick, wall plaster, and other types of debris. Two of them struck something more intriguing: what looked like the remains of a stone structure.

The following season, the Rivanna team excavated a five-foot-square trench where they'd hit stone the previous year. What slowly emerged was a beautifully preserved foundation made of sandstone conglomerate sourced from the property. By the end of their 2015 excavations, the researchers had dug 10 similar trenches, ranging from 1.5 to three feet deep, and discovered several segments of the foundation. And by the end of the 2016 season, they had dug 12 more trenches and built a picture of what Ford calls the remains of "a very impressive structure" that he thinks is the 1799 or 1800 Monroe residence. The trenches, spread over an area half as big as a basketball court, revealed evidence of an eastern wing 30 feet wide by 40 feet long, just as shown in the insurance drawings. The team couldn't excavate the entire western wing, because it extends under the existing Massey House. The portion they did uncover is 18 feet wide, as is the western wing in one of

Excavations in Highland's boxwood garden (above), in front of the 1870s Massey House, uncovered a stone foundation, now thought to be the remains of Monroe's actual home. Among the excavated artifacts is a sherd of cornflower-patterned china (below), likely belonging to the Monroe family.

the insurance documents. The implications were inescapable. The cottage, rather than being part of Monroe's home, was merely his guesthouse.

Making the case more convincing still is ample evidence of a devastating fire, which nineteenth-century and early twentieth-century documents cite as having destroyed at least part of the original Monroe dwelling. In the trenches, archaeologists identified a thin layer of jet-black charcoal, topped by 10 to 12 inches of mortar, bits of brick, and similar materials. The debris is densest inside the foundation walls, suggesting it was used as fill after the fire.



Other finds include charred wood and china painted with a cornflower pattern known to have been made in eighteenth-century France. Jefferson had similar china, and the Highland cornflower pieces were most likely Monroe's, Bon-Harper says.

The dendrochronology results had made clear that Monroe's cottage was not old enough to be his house, and the letter from Monroe hinted at the cottage's true role. But excavation provided the clinching evidence, says Matthew Reeves, director of archaeology and landscape restoration at nearby Montpelier, James Madison's estate. "In this case, the missing link is the main house that is buried in the ground under a bunch of boxwoods and a walkway."

THE REVELATIONS AT Highland demand a change in how the site is displayed, says Bon-Harper. She wants to build a canopy over the dig site so visitors can watch the process unfolding, and she'd like the visitors to take the foundations into account as they formulate their image of Monroe. "This isn't just a story about a house," she says. "It's about understanding Monroe better. If you look at a humble, vernacular structure, you think of a man of modest means who was not very ambitious, whereas if you look at the reality of the situation, it was a fairly impressive house." It was certainly more substantial than the cottage.

For the people who spent decades thinking that the cottage was Monroe's house, the new conclusions aren't necessarily easy to swallow. But scholars point out that the pedigree of old buildings is often fogged by time. "If there's anything I've learned in looking at historic houses and researching history, it's that the past is not a fixed destination," says architectural historian Hugh Howard. "We have to look at these structures with an understanding that sometimes they have been interpreted, by people with the very best of intentions, in a way that doesn't necessarily serve the historical record—especially after new knowledge comes to light." Bon-Harper hopes that correcting the record about the house will help reshape attitudes about Monroe. "The cottage conveyed a sense of a modest house," she says. "But the idea of Monroe as this rural, uncultivated, unambitious figure needs to be revised, and this discovery gives us the opportunity to do just that." ■

Traci Watson *is a journalist based in Washington, D.C.*

Looking Beyond the Hillforts

A unique settlement in southwestern England is changing archaeologists' views about how Iron Age people lived 2,000 years ago

by Jason Urbanus

British archaeologist Mortimer Wheeler, writing in the 1940s, memorably re-imagined a Roman attack on the Iron Age hillfort of Maiden Castle in southwestern Britain. Having found signs of violent trauma on the bodies of the native dead lying in the cemetery there, he dramatically interpreted the events of the assault:

> *"First the regiment of artillery...was ordered into action and put down a barrage of iron-shod ballista arrows.... Following this barrage, the infantry advanced up the slope, cutting its way from rampart to rampart, tower to tower.... But resistance had been obstinate and the fury of the attackers was roused...confusion and massacre dominated the scene...men and women, young and old, were savagely cut down before the legionaries were called to heel...."*

Wheeler's excavations at Maiden Castle exposed the lives of a Late Iron Age people, known today as the Durotriges, and their resistance—as he saw it—against the invading Roman armies of the first century A.D. After Roman subjugation of Britain, the surviving Iron Age communities there were forced out of their hillforts and resettled into newly established Roman towns on lower-lying terrain. In the years to come, Roman culture would supplant centuries-old native traditions.

Researchers near the village of Winterborne Kingston have excavated some 15 roundhouses of an estimated 200-300 that were part of the previously unknown Late Iron Age settlement of Duropolis.

In this burial, the deceased is placed in a crouched position, on the right side, facing northward. This custom makes the Durotriges distinguishable and identifiable among most other Iron Age tribes.

Or at least, this is how events are often portrayed. For the better part of a century, Wheeler's evocative archaeological report has influenced perspectives of the Roman conquest of the region and framed perceptions of the people who lived there.

However, in recent decades, both the reevaluation of the excavations at Maiden Castle and the discovery of new archaeological sites have begun to present a different picture of the Durotriges in the years before and after Roman occupation. One of the newly discovered sites is a Durotrigian settlement located outside the village of Winterborne Kingston in Dorset. The site, dubbed "Duropolis" by archaeologists, dates to around 100 B.C., and is one of the largest prehistoric settlements ever discovered in Britain. According to archaeologist Miles Russell of Bournemouth University, the current excavations are forcing a reinterpretation of long-held beliefs about the late Iron Age and providing a fresh look at Durotrigian culture and behavior. "Wheeler's fantastic story was brilliant and has captured the public's imagination until this day," says Russell, "but it's wrong." Archaeologists are trying to move away from Wheeler's interpretation and get a better idea of what was happening to the population when the Romans arrived.

Today, Duropolis sits beneath fertile green fields on a low-lying slope, remnants of it scarring the gleaming white chalk subsurface exposed by the excavations. While almost no trace of the ancient town remains visible aboveground, an astonishing number of dwellings—as many as 200 to 300, spread across as much as 50 acres—may lie hidden. Although it is not known what the actual name of the settlement may have been originally, the Durotriges Project directors, Russell and Paul Cheetham, also of Bournemouth University, called it "Duropolis" as a kind of playful portmanteau, combining the "Duro" from Durotriges with the ancient Greek word for city (*polis*). They believe the name conveys the size and nature of the site in a way that formal archaeological terminology and naming conventions do not.

While the discovery of Duropolis itself in 2015 came as a complete surprise, the archaeologists were aware of the area's potential as early as 2007. The local landowner had notified authorities that she routinely exposed ancient pottery and other material while plowing her fields. Metal detectorists investigated and supported the high probability that something major was sitting beneath the surface. "That information gradually filtered back to us at the university and, as it happened, we were looking for project sites for the students," says archaeologist Harry Manley. The initial geophysical survey revealed a series of pits, ditches, and an odd banjo-shaped enclosure. These features were the telltale markings of the Iron Age Durotriges population.

For the most part, Iron Age communities, frustratingly, left behind almost no written records, making it difficult to ascertain details about their behavior, social structures, or even what they called themselves. But when the Romans arrived in Britain in A.D. 43, they began to document the indigenous populations they encountered. They are the first to record the name "Durotriges," but the term survives only in a few classical texts. To the Romans, the Durotriges were a loosely united ethnic and cultural group that occupied an area of England roughly equivalent to modern-day Dorset. After the reorganization of Britain into Roman administrative centers in the first century, the principal Durotrigian settlement was established at Dorchester (Durnovaria Durotrigum) around two miles from Maiden Castle.

Despite the dearth of information on Iron Age British peoples, the Durotriges stand out as the most culturally and archaeologically distinguishable group, specifically because of a few unique cultural practices. One of their most recognizable customs is the manner in which they buried their dead. The Durotriges always interred the deceased in a crouched position, lying on their right side, head to the east, facing northward, with hands tucked up under the chin. "Of all Iron Age cultures, this is what makes them so distinctive," says Cheetham.

Another characteristic trait was their penchant for living in hillforts fortified with extensive ditches and earthen ramparts. In fact, the term Durotriges may have its roots in the words *duro*, meaning "fort," and *triges* or *riges*, meaning

"kings." Throughout the later Iron Age (400 B.C.–A.D. 100), the hillforts of the Durotriges commanded the landscape of southern Britain at sites such as Hood Hill, Bradbury Rings, and Maiden Castle. For several hundred years these were the predominant Iron Age settlements of the region, thought to have persisted right until the Roman era. Recent scholarship, however, is asserting that the hillfort system was in decline long before the Romans arrived.

Despite Wheeler's vivid report, Russell and Cheetham find it highly unlikely that Maiden Castle was attacked by Roman legions, since most of its population probably abandoned the site a century earlier. But where then did the population go if they no longer lived in places like Maiden Castle? The answer may be found at Duropolis, a mere 10 miles away.

FROM THE OUTSET, the Bournemouth University project hoped to examine a site that could inform the understanding of the important transitional era between the end of the Iron Age and the beginning of the Roman period. The location that was brought to their attention near Winterborne Kingston had the added attraction of not being in the immediate area of the hillforts. "The archaeological evidence

An aerial view of Maiden Castle, one of the largest hillforts in Europe. Research now suggests that sites like this were being abandoned in the first century B.C. in favor of open settlements, such as Duropolis, on lower-lying terrain.

has always tended to focus on the big, prominent sites like the hillforts, and not on the rural sites," says Russell, "which tell us more about what ordinary people are doing, what they are like." For the first several seasons the project encountered a broad spectrum of archaeological material, ranging from Bronze Age to post-Roman artifacts. However, the "banjo enclosure" that was discovered, along with several roundhouses, pits, and burials, indicated that the site was especially active during the Late Iron Age. They suspected that a significant residential area might lie somewhere in the vicinity, even though they had been unable to locate it. That changed in 2015.

That spring, Russell and Cheetham decided to investigate new ground a short distance from their previous excavation sites. They had been drawn to the area by some unusual crop marks that had appeared during particularly dry summers in the previous years. The results of a pre-excavation geophysical survey were astounding. The images revealed evidence of a veritable beehive of human activity just beneath the surface. The extraordinary mass of pits and circular ditches represented the previously unknown Iron Age town Duropolis. "It was a complete surprise," says Russell. "There was no hint that this particular site was here, no indication in the way of surface finds or earthworks. Until it came up on the geophysical survey we simply had no idea."

At its height, in the first century B.C., Duropolis may have held as many as 300 roundhouses, each ranging from 30 to 50 feet in diameter. Over the past two seasons, around 15 have been excavated. The size, density, and sophistication of Duropolis has been an extraordinary revelation, especially given its location, which was considered largely void of such pre-Roman settlements. "The view has always been that this part of Britain [Dorset] was less developed when the Romans arrived," says Russell. "The south and east had more contact with the continent, so they've got larger, more planned Iron Age towns, whereas the southwest hasn't. But Duropolis challenges that view, and suggests that there are quite large settlements with a degree of social organization similar to what's going on elsewhere."

After the announcement of the discovery of Duropolis, media outlets quickly hailed the site as "England's oldest town," a title often bestowed on the Roman town of Colchester (ca. A.D. 43). While this honor can be debated ad infinitum (it is notoriously difficult in archaeology to agree upon what exactly constitutes a "town"), Duropolis' significance lies not necessarily in its age or what it contains, but instead in precisely what it does not have—a fortification system. This is perhaps the most surprising aspect of the town. In an era when large communities were customarily surrounded by elaborate networks of ditches and ramparts, Duropolis appears to have been completely open and unenclosed. It is a new and different kind of Iron Age settlement that skews long-established paradigms of the British Iron Age. The proliferation of the hillfort system, with its emphasis on defense, was indicative of a time in the Late Iron Age when war between neighbors was considered common. Defensive systems were essential for community survival. It was only after the Romans conquered Britain, resulting in some degree of stability, that open settlements became safe and viable. Duropolis contradicts that theory and represents a kind of missing link, bridging the chronological gap between hillforts and Roman towns. To Russell and Cheetham it confirms that communities were living in large open centers before the Romans arrived, and counters the myth that everyone lived in protected hillforts. Perhaps even some of the former residents of Maiden Castle made their homes there, or nearby.

While the roundhouses of Duropolis have shaped a new understanding of the layout, organization, and even location of prehistoric communities, the site also provides an intriguing glimpse of Iron Age customs, beliefs, and of the Durotriges themselves. Intact undisturbed Iron Age burials are exceedingly rare in Britain, since most communities cremated their dead or deposited them in rivers and bogs where it is difficult for archaeologists to find them. The Durotriges are one of the few tribes that performed inhumation. Across the site, 27 graves have been excavated thus far. Thanks to modern technology, the well-preserved remains may soon be able to provide unprecedented genetic information about the people who lived in southern Britain 2,000 years ago. "The majority of prehistoric tribes did not bury their dead in this way, so we get cremations or disarticulated bone, neither of which is good for reconstructing past societies," says Russell. "So if you want to try and understand age of death, disease, or relative aspects of health, it's really only in places like this that we get the evidence we need."

Although much of what would have existed aboveground has been wiped away by centuries of agricultural plowing, the Durotriges seemingly had a passion for digging pits, the contents of which have survived. Initially evident in the geophysical images and later confirmed through excavation, the fields around Duropolis are littered with hundreds, if not thousands, of large pits. These are not uncommon throughout the territory of the Durotriges, but they have frequently puzzled archaeologists. "They are enormous—up to 10 feet deep—and really quite impressive," comments Cheetham. "When they were first found [in the 19th century], the antiquarians thought that people were living in them as underground houses."

While this theory no longer prevails, it is currently believed that these pits were originally built as subterranean food-storage tanks, either as chilled underground cellars for meat and dairy products, or as silos to hold surplus agricultural crops and seed grain. After a period of time, for whatever reason, perhaps structural instability or bacterial contamination, these tanks would become unsuitable for use and were backfilled. Oftentimes they were filled with trash and other discarded material from the adjacent households. The objects and artifacts that were included in the backfill have survived through the millennia and offer insights into Late Iron Age

A horse jaw and cow skull found buried together typify the Durotriges practice of depositing sacrificed animals in pits, and sometimes creating hybrid creatures from the dismembered body parts of different animals.

life. These middens contained pottery, butchered bone, loom weights, spindle whorls, and metal material, all of which have helped archaeologists reconstruct daily Durotrigian household activities. "It's good to find their rubbish," says Russell. "At last we can see what they were eating and making."

While these household trash deposits may be a testament to the ordinary, other pits and deposits attest to the decidedly extraordinary, if not bizarre. The process of backfilling obsolete pits was a religious and spiritual affair for the Durotriges. Dozens of excavated pits were found to contain specialized ritual deposits that were deliberately placed in the tank before it was sealed. Sometimes these were relatively pedestrian objects, such as broken quern stones or pottery, but many others contained sacrificed animals. Because these subterranean pits may have been associated with deities who monitored and controlled agricultural conditions, animal sacrifices may have been performed as offerings or propitiations to ensure successful harvests and healthy herds. The skeletal remains of sheep, dogs, and pigs that have been found at the bottom of these pits were likely left as part of this process.

However, other creatures, more befitting Greek mythology or Mary Shelley's *Frankenstein*, have also been unearthed. For reasons not entirely understood, the inhabitants of Duropolis were creating hybrid animals, assembled from the dismembered body parts of freshly killed animals of different species, and depositing them in the pits as well. Archaeologists have found a horse skull with a cow's jaw, a cow with a horse's legs, a six-legged sheep, a sheep with an added head belonging to a cow, and a horse with a cow horn protruding from its forehead. The mixing and matching of cow and horse limbs seems to have been of particular importance.

Although it cannot be said with certainty why these strange hybrid creatures were left as offerings, perhaps they were viewed as particularly potent votives, reserved for times when the Durotriges needed especially strong favor from the gods. This may also be the motivation behind a possible incident of human sacrifice. In only one instance did archaeologists find human remains buried in one of the pits. These belonged to an adult female, whose body was lying on a bed of carefully arranged animal bones. Russell believes that cut marks on her clavicle may indicate that her throat was deliberately slit as part of a ritual ceremony. "There might be key points when society is at a level of stress so great that they actually sacrifice their own, rather than putting animal remains into the pits," he says. "In the past, we've always viewed the Roman descriptions of Britons committing acts of human sacrifice as negative propaganda. But the more sites that have been dug, and the more evidence we uncover, we see that they actually do that. To us, it seems a very deeply unpleasant aspect of their lifestyle. But," he adds, "for them, at certain times, it was necessary."

The persistence of native Iron Age behavior and culture at Duropolis is one of the more striking revelations. Traditional thought has long been that native life changed soon after the Romans arrived in Britain. Roman language, behavior, and architecture were believed to have transformed native communities, often forcefully. However, in Duropolis, Iron Age customs continue to persist even after the Roman conquest.

The discovery of a human female skeleton with suspicious injuries, lying on top of a pile of horse and cow bones, suggests that she may have been ritually sacrificed, possibly along with the animals.

There are very few signs discovered thus far that attest to any Roman presence or culture at the site whatsoever until a couple of hundred years later. "There is no evidence of any transition, violent or otherwise, to a more Roman way of life," says Russell. "Roman ideas and fashions seem to have passed the site by." This suggests that the transition to Roman Britain, which has so often been characterized as driven by Roman violence and suppression of native communities, is more complex and still not completely understood.

With future excavations planned by Bournemouth University, it remains to be seen how much more impact Duropolis will have on shifting the image of life in Dorset 2,000 years ago. Perhaps Duropolis is an anomaly, a rogue community that is not entirely indicative of the times. But perhaps it isn't, and is just the first of many of its kind that have eluded detection until now. Its discovery could turn archaeologists' attention to areas that were previously thought to be unoccupied during the Late Iron Age. "All of the focus before now has been on the hillforts, because they're obvious and you can see them," says Russell. "But it may be that every single slope in this area has got a settlement like this. It's just that no one has looked." ■

Jason Urbanus ***is a contributing editor at*** **Archaeology.**

Banded slate bannerstone, Michigan
Height 5 inches

Porphyry granite bannerstone, Iowa
Height 3.4 inches, width 4.5 inches

SET IN **STONE**

Why did prehistoric Native Americans fashion the enigmatic objects known as bannerstones?

by Eric A. Powell

Around 8,000 years ago, in the woodlands of what is now the eastern United States, hunter-gatherers began to make stone objects with holes drilled in them that have no parallel in any other prehistoric society. Today, archaeologists call these highly polished and sometimes elaborate objects "bannerstones." The name was coined by early twentieth-century scholars who thought they must have been mounted on shafts and used as emblems or ceremonial weapons. But just why they were made only during the so-called Archaic period, which ended around 3,000 years ago, has been debated by archaeologists for more than a hundred years.

Some have taken the position that they were not strictly ceremonial and were used as weights that imparted force and accuracy to spear-throwers, or atlatls. They were made from a wide variety of stone materials and in different sizes and shapes, though many take a "butterfly" form, so they may not all have been used for the same purposes. "Archaeologists are mystified by bannerstones," says University of Florida archaeologist Kenneth Sassaman, who has studied the artifacts in detail. "We can't know for sure what Archaic people were doing with them."

The latest scholar attracted to the mystery of bannerstones is Fashion Institute of Technology art historian Anna Blume, who is making an intensive study of these artifacts in the collection of the American Museum of Natural History in New York. She has spent countless hours studying the objects. "Bannerstones get noisier and noisier the more time I spend with them," says Blume. "These extraordinary Native American works from deep time still have a lot to tell us." Her project is one of several that are providing a new vantage point from which to observe these intriguing objects, which Blume calls "still lifes in stone."

Granite bannerstone, Florida
Height 4.5 inches, width 4 inches

Carnelian bannerstone, Tennessee
Height 3.7 inches, width 5.3 inches

Modern replica of an atlatl with a bannerstone attached

In the 1930s, University of Kentucky physicist-turned-archaeologist William Webb began excavating graves left by a culture known as the Shell Mound Archaic in Kentucky's Green River Valley. Helped by a team of Works Progress Administration laborers, Webb unearthed a number of the drilled stones, which were by then already known as bannerstones. Because he found them lying between hooks and handles made of antler, he assumed they had once been connected to a wooden atlatl that had since disintegrated.

Atlatls are essentially throwing sticks with a handle on one end and a hook on the other that can hold a spear. By drawing the spear-thrower back and then hurling it forward, a hunter can use the atlatl as a lever to launch a spear, sending it farther and with more power than if launched only by hand. Webb assumed the bannerstones were meant to somehow increase the efficiency of such spear-throwers. Perhaps inspired by his background in physics, Webb made a long study of atlatl mechanics and determined that bannerstones were used as weights that added velocity and power to the spears hurled from the atlatl.

Since Webb published his ideas in 1957, at least two generations of archaeologists have tried to replicate his results. Despite the fact that they are often still referred to as atlatl weights, scholars have largely been unable to show that bannerstones improve atlatl efficiency. "Like a lot of my colleagues, I experimented early on with atlatls and bannerstones," says Alan Harn, curator emeritus at Dickson Mounds State Park in Illinois. "I must have cast hundreds of spears trying to understand them, but I never got a bannerstone to add thrust and power. They slowed me down." Eventually, Harn gave up.

In 1983, longtime avocational archaeologist and replicator of ancient technology Larry Kinsella won the Atlatl World Open Grand Championship in Wyoming using an atlatl without a bannerstone. The next year he returned and used an atlatl fitted with a bannerstone that he had made himself. To his dismay, the bannerstone helped with neither distance nor accuracy, and Kinsella's performance fell well below that of the previous year. He lost his title as world champion. "That's when I decided to really understand bannerstones," says Kinsella. "I knew that they were gorgeous and aesthetically pleasing and probably had some ceremonial role, but I figured they must have originally had some utility too—just not as atlatl weights." He experimented with replicating different kinds of atlatls and pecked, scraped, and perforated dozens of pieces of sandstone, limestone, quartz, and other rocks to create a variety of bannerstones. After thousands of atlatl trials with and without bannerstones, he realized that his performance at the world championship was not a fluke. Bannerstones did nothing to improve the efficiency of a spear-thrower.

While observing the behavior of white-tailed deer as he picked mushrooms in the woods near his Illinois home, Kinsella had an epiphany. After the end of the last Ice Age, he knew, white-tailed deer would have been the main prey of hunters in the eastern woodlands of North America. Stalking these animals in deciduous forests with an atlatl presents a

Banded slate bannerstone with trace fossils, Ohio
Height 3 inches, width 4.5 inches

Banded slate bannerstone, New York
Height 2.9 inches, width 6.2 inches

challenge. Because of the dense forest cover a hunter must get close to prey but not startle it—any movement or sound will scare a deer away. Ambush from a tree is not feasible with an atlatl, so the hunter must be on the ground and have enough clearance to draw back the spear-thrower. A deer will often spot a hunter positioned in ambush and stare at them for two or three minutes, during which time the hunter must remain still. "A hunter had to be prepared to outwait a deer with an atlatl at full draw, ready to launch," says Kinsella. "And they had to be prepared to wait several minutes before hurling the spear." But Kinsella notes that in those minutes, fatigue can set in, enough to make throwing a spear accurately very difficult. Through experimentation, he found that bannerstones acted as counterbalances, lengthening the time he could remain motionless holding an atlatl in launch position before his muscles began to tire.

To test the hypothesis, anthropologist Herman Pontzer, now of Hunter College, hooked Kinsella up to an electromyography machine, which measures electrical waves produced by muscle activity. He then had Kinsella hold an atlatl in prelaunch position for two minutes with and without a bannerstone, then repeated the same trial several days later. Pontzer found that Kinsella experienced much less muscle strain when holding an atlatl with a bannerstone attached. "That showed that bannerstones do give a hunter a mechanical advantage, just not the one Webb thought," says Kinsella. Harn, for one, has greeted Kinsella's work enthusiastically. "It's great to have someone like Larry spend so much time on this and figure out the nuts and bolts," says Harn. "He showed us what we were missing. When I heard his idea that they were counterbalances, I thought, 'It all clicks. That's what the Archaic people were using them for.'"

Sassaman agrees that bannerstones likely began as a mundane tool to aid hunting. He says examples of crude versions of the stones found in domestic trash show they probably didn't always occupy a ceremonial role in Archaic life. But over the millennia, as bannerstone forms evolved, he thinks it is clear they also played a nonutilitarian role in society. Sassaman has studied nearly 150 bannerstones excavated by early twentieth-century archaeologists in the Savannah River Valley of Georgia and South Carolina. He says that changes in their morphology can help us reconstruct the history of Archaic cultural change.

The earliest bannerstones were made by the Shell Mound Archaic people around 6000 B.C. By around 3800 B.C, people in the Savannah River Valley had begun to fashion them. These early bannerstones were tubular, and many were very refined. "These finely finished ones are found exclusively in graves during this period," says Sassaman. Some were found in burials of women and children, perhaps suggesting they had already attained a meaning outside the context of hunting. "Maybe they were needed for passage to the other world," says Sassaman. Then, around 3200 B.C, a more diverse group of bannerstones began being made, and were even exported to northeast Florida, which had no suitable sources of stone. At this point, Archaic people seem to have stopped including

Banded slate bannerstone broken and perforated, Ohio
Height 3.3 inches, width 3.7 inches

Igneous bannerstone preform, Georgia
Height 4.5 inches, width 4 inches

bannerstones in graves.

Around 2700 B.C, people in the Savannah River Valley began to make bannerstones in oversized elaborate shapes that archaeologists call "hypertrophic." Sassaman thinks the impulse to create these dramatic objects may have been linked to changes in the ways different groups interacted with each other. "This is the most fascinating phase," says Sassaman. "Some of these bannerstones are monsters, as much as half a foot in diameter. There's no way a hunter needs to be carrying around a stone that big." He notes that these bannerstones are also not found in graves, but clustered in mounds that were sites of social gatherings. Interestingly, while these bannerstones are more elaborate, they are also less varied in form.

Sassaman says a similar thing happens at the same time among Archaic people living around the Great Lakes and on the Atlantic coast from what is now Virginia to Massachusetts. All these regions lie on the outskirts of the area occupied by the Shell Mound Archaic culture, where the tradition of making bannerstones was the strongest, but which is not known to have produced the hypertrophic versions. "I think these exaggerated forms have to do with intercultural relations," says Sassaman. "Here you have people outside the Shell Mound borders, and by making these hypertrophic forms these people are yelling loudly, 'This is who I am!'" Bannerstones then could have become emblems of ethnic identity, made by people acutely aware of the other groups that lived in the eastern woodlands. "We often think of Archaic people exclusively in terms of how they related to their environment, but they had to interact with other ethnic groups too," says Sassaman, "and bannerstones were probably part of that."

At the American Museum of Natural History, Blume has combed through a collection of some 500 bannerstones that were collected a hundred years ago or more and have since gone unstudied. Of those, she's selected 61 for further analysis. Blume has spent months photographing them from multiple angles and taking a series of measurements. She plans to make all her data and images accessible online to scholars and the public in the near future.

Blume, who also studies the ancient Maya, says that many bannerstones, especially the hypertrophic examples, are so distinct and beautiful that in any other context scholars would assume they were prestige objects, made for the rich and powerful. But Archaic societies were egalitarian. "They had no social or class distinctions," says Blume. Though bannerstones may have played a larger ceremonial role within Archaic groups, she believes the bannerstones themselves would have had special meaning to the people who fashioned them. "These pieces are highly individualized," says Blume. "They record an intimate sensibility, and a personal touch is obvious in each one."

Blume points out that even today, modern flintknappers like Kinsella take great pride in their abilities and the stone artifacts they produce. Making an elaborate bannerstone would have presented a different challenge than making spear points or axes and might have been a particular source of satisfaction for prehistoric flintknappers. "With points you are limited to

Banded slate bannerstone miniature, Ohio
Height 2 inches, width 2.5 inches

Slate birdstone, Ohio
Height 1.2 inches, length 5.7 inches

stone that is flakeable and will make a good point," says Blume. "But bannerstones are pecked and ground, so they could be made from a wider range of materials." Granite, limestone, and quartz are all unsuitable for spear points, but each would have had its own aesthetic appeal. Some bannerstones were clearly made with the specific geology of such stones in mind, preserving fossils or colorful banding. "They offered a bigger lithic palette to knappers," says Blume, "and that was important because you might make hundreds of points in a lifetime, but you would make only a few bannerstones."

Blume believes Kinsella has shown that bannerstones were once used as atlatl counterbalances during hunting and also agrees with Sassaman that the hypertrophic forms played some kind of ceremonial role in Archaic societies. She also adds a third category—miniatures. Long suspected to be modern fakes, miniature forms of bannerstones are often just two inches across, and Blume is convinced they were also made by Archaic people. "These are representations of bannerstones, rather than bannerstones themselves," says Blume. "Perhaps they had a ceremonial role, or perhaps they were meant simply to be enjoyed aesthetically." Blume has also selected a number of preforms, or unfinished bannerstones, to study. "When is an object considered finished? That is always a fascinating question," says Blume. "It's important for us to consider these preforms, which we know were sometimes being exported or traded by the people who made them."

Blume is also fascinated by bannerstones that were broken and then reused. Broken bannerstones often have a second perforation, which could have been used to thread rope through. Perhaps these were worn as necklaces or were suspended from staffs during ceremonies. Some also seem to have been intentionally broken in an act archaeologists call ritual "killing," a term Blume doesn't feel is quite right. "I think of them as ritually broken rather than killed," says Blume. "'Broken' is an interesting word. You break bread with someone, for instance, and it has positive metamorphic possibilities." Blume thinks that by intentionally breaking a bannerstone, an Archaic person wasn't necessarily bringing it to the end of its useful life, but perhaps aiding its transition to another form.

After around 1500 B.C, bannerstones seem to disappear from the archaeological record, even though atlatls continue to be used for at least another two millennia. Blume notes that it is possible that people began using nets to kill deer, and bannerstones lost both their utilitarian and metaphoric roles. "For whatever reason, they became obsolete," she says, "and something else took their place in these peoples' conceptual toolbox." Blume points out that complex stone pipes appear around this time, and that finely made, drilled stone figures depicting birds may have been mounted on atlatls, perhaps occupying the cultural niche once filled by bannerstones. The skills and aesthetic appreciation Archaic people once lavished on these unique objects changed focus, and the bannerstone tradition vanished.■

Eric A. Powell *is deputy editor at* Archaeology.

The story of the continent's earliest human arrivals is being revealed at a rock shelter in remote and challenging territory

by Kate Ravilious

THE FIRST AUSTRALIANS

"If you see a Yamuti, then hide in a tree," Adnyamathanha children are told, "for the Yamuti can't lift its head to the sky." For some Australians, learning about the Yamuti—a terrifying mythical creature that eats people and carries children away—is a rite of passage. The Adnyamathanha, one of Australia's many aboriginal communities, have inhabited the Flinders Ranges in northern South Australia and passed down stories of the Yamuti for as long as they can remember. Some believe the myth has its origin in a long-extinct, hippo-sized mammal called the diprotodon—the largest marsupial known to have lived. Archaeological excavation inside a recently discovered rock shelter suggests that Australia's earliest human occupants did, in fact, interact with these giant beasts more than 40,000 years ago. But the finds in the shelter, known as Warratyi, reveal much more. They show that people traveled into the continent's arid interior far earlier than previously thought, and were culturally and technologically more sophisticated than once believed. Warratyi, researchers say, is rewriting the history of the first Australians.

It is generally agreed that humans were well established on the Australian continent, most likely after crossing over from the Indo-Malaysian Archipelago, by 50,000 years ago. The skeleton of "Mungo Man," found at Lake Mungo in New South Wales in 1974, dates to at least 40,000 years ago and is the oldest human skeleton found in Australia. In places such as the Madjedbebe and Nauwalabila rock shelters in the Northern Territory, humans left artifacts that are even older, but what these first Australians did next is not at all clear. Australia's unforgivingly arid climate rapidly degrades organic materials such as wood, shell, and bone, so few locations preserve good evidence of human occupation. The sites that have been found so far suggest that the first arrivals traveled both east and west, hugging the familiar, resource-rich coastline. There has been little evidence that they ventured into the interior, which raises doubts about whether the earliest people were capable of conquering the harsh landscape when they initially arrived.

But that doesn't mean they weren't in the outback. Australia's interior is vast and largely empty, and archaeologists have explored only a small fraction of it so far. Giles Hamm, an archaeologist at La Trobe University in Melbourne, has never been convinced of the coastal theory, and has always believed that the evidence for outback occupation is there somewhere, if only it can be found. In 2007, he teamed up with an Adnyamathanha elder, Cliff Coulthard, to search the Flinders Ranges, a rugged mountain belt 300 miles north of Adelaide, for places where early Australians might have left a trace. After excavating a couple of relatively recent occupation sites in the southern Flinders, they shifted to the

A rare combination of geological processes created the Warratyi rock shelter in the Flinders Ranges of northern South Australia. Evidence discovered there indicates that humans traveled into Australia's interior more than 40,000 years ago.

north and systematically searched gorges for open sites, especially ones where sediments could accumulate and preserve artifacts and bones.

The discovery of the Warratyi rock shelter was serendipitous. While walking along a dry creek bed to respond to the call of nature, Coulthard looked up and noticed a crescent-shaped black slit high in a rugged band of rocks. He scrambled up to it and called Hamm over for a look. They found a naturally occurring shelter that looked like a cozy room perched above the bone-dry landscape. Their curiosity was immediately piqued by the blackened appearance of the ceiling. "I wondered if it could be soot," says Hamm.

"From the moment we got there, I had a good feeling about the place," says 63-year-old Coulthard, who has been exploring the Flinders landscape since he was a small boy. The shelter is around 12 feet deep and just high enough to stand in. More fortuitously, an ancient rockfall in front of the cave had created a small lip that allowed sediments to build up on the cave floor over the millennia. Hamm immediately saw that the floor was littered with tiny quartz flakes, evidence of tool production. "When I stuck my probe into the floor and it went down almost a meter, you should have heard me yelp!" says Hamm. "It was just brilliant. And then when I pulled the probe out I could see ash, and realized that this site was special." Hamm had no idea then how long the site had been occupied, but the proximity of a potential water source—freshwater springs nearby—made him hopeful that it had hosted at least a few thousand years of occupation.

Hamm assembled a team of excavators and experienced artifact-dating experts. They dug a pair of six-foot-long trenches in 2012 and 2013. Except for some minor disturbance from burrowing rabbits near the surface, the sediments were compacted and undisturbed. In the three tons of soil they sifted, they were able to recover an astounding 4,300 artifacts.

THE VERY LOWEST LEVEL, close to the rock floor, produced only a handful of artifacts, but the story behind these finds more than made up for their scarcity. In particular, there were two fragments of burned eggshell belonging to a flightless bird called a giant malleefowl, which

went extinct around 42,000 years ago, and a partial thigh bone from the massive diprotodon, which went extinct around 44,000 years ago. The animal remains were found in association with worked quartz flakes, small fragments of bone, and red ochre.

Dating deposits from the earliest stages of Australian history has been a challenge. The climate is unfriendly to the organic materials that often provide the radiocarbon used for dating. Further, in samples older than around 40,000 years, the amount of radiocarbon remaining is very small and difficult to measure, so only exceptionally well-preserved samples can provide reliable dates. Luckily, eggshell turned up at Warratyi.

This bone fragment (above), found in the earliest levels of the rock shelter, was carried there by humans. It is from a large herbivore (top) called a diprotodon. Weighing some 3 tons, it became extinct around 44,000 years ago.

"Unlike in bone or charcoal, carbon preserved in eggshell is very stably locked in and unlikely to have been contaminated," says Nigel Spooner from the University of Adelaide. The archaeologists also turned to optically stimulated luminescence of quartz in the sediments surrounding the artifacts, which measures when the mineral was last exposed to sunlight.

Taken together, the dating methods suggested that the artifacts could have been deposited in the rock shelter 49,000 years ago, not long after the first migrants to the continent arrived. "The diprotodon bone is a remarkable find," says Chris Clarkson, an archaeologist at the University of Queensland. "And given its location—high up in a narrow rock shelter—it wouldn't have arrived by chance. It shows a likely human association with the megafauna."

Fossil evidence shows that megafauna such as diprotodon and the emu-like giant malleefowl roamed the Australian landscape for many tens of thousands of years before humans arrived. Exactly why the megafauna all died out around 44,000 years ago has spurred a contentious debate between those who argue that a cooling climate brought about their demise and those who believe the newly arrived humans hunted them to extinction. Unfortunately, the fragments recovered from Warratyi can't settle this argument, since there are no cut marks on the diprotodon bone to prove that humans butchered the creature. But there is no doubt that humans brought these things up to the rock shelter, and were living in this interior region by 49,000 years ago—nearly 10,000 years earlier than at any other interior site found to date. Diprotodon footprints preserved in the sediments of a nearby lake show that the massive marsupials were relatively common in this region when humans first arrived. "It wouldn't be surprising if humans did hunt megafauna, and given the long gestation periods that these animals have, it would have been easy to deplete their numbers quite fast," says Hamm. "But we don't have sufficient evidence, so the argument remains unresolved for now."

The stone tools recovered in association with the megafauna remains were simple, handheld blades, made from either quartz or silcrete (a hard, compacted sedimentary rock that is found locally), which Hamm thinks would have been used mainly for woodworking and perhaps for stripping plants. Some of the tools held fragments of red ochre dating to 49,000 years ago, and some held white gypsum powder dating to 40,000 years ago, showing that the tools had been used to pound rocks into a fine powder. "This is the earliest evidence for both red ochre and white gypsum use in Australia, and it is likely to have been used for body art on ceremonial occasions," explains Hamm. Such activities point toward the presence of cohesive communities, rather than occasional groups of intrepid explorers. But what brought people to this inhospitable place, and how did they travel so far across the continent from the north coast to South Australia?

A FEW SCRUBBY BUSHES and small trees grow near some freshwater springs, but the landscape around Warratyi today is mostly parched and dry: bare, orange-red rock and sand, as far as the eye can see. Previous analysis of climate data from lake sediments, however, shows that the Flinders Ranges were more hospitable 50,000 years ago. Cooler temperatures and more rainfall made for a lusher landscape. "There would have been many more shrubs and trees than we see today, and the entire area would have supported more wildlife," says Hamm. He thinks it likely that the first humans to arrive in Australia followed a string of rivers and lakes reaching southward from the Gulf of Carpentaria on the north coast. Richard Roberts, from the University of Wollongong, who has worked on some of Australia's other early human occupation sites, agrees that this is plausible. "In many ways it is surprising we've never found arid interior shelters like Warratyi before," he says, "as the climate was relatively good when the first people arrived, and interior lakes and rivers were in good nick."

However, natural rock shelters such as Warratyi are not common in the Flinders Ranges. In this case, the crescent-shaped cave had been created by an unusual arching fold in the rocks called a syncline. The shelter would have commanded a good view of the valley, especially during wetter climate interludes when the landscape was covered with trees, and made it easier to spot game and see other people coming and going. Perhaps most important of all, the fracturing in the local rock created the freshwater springs. Although there is no evidence for long-term settlement at the shelter, numerous deposits of charcoal mixed with bone suggest that it was a popular spot to cook a meal, rest a while, and survey the landscape. "These hearths were very small, and most likely people were just roasting something little like a lizard," explains Hamm. Meanwhile, the relatively large amount of red ochre and gypsum powder discovered there hint that it may also have been important for ceremonial purposes. "Possibly people went up there," he says, "to paint themselves and prepare for the ceremony."

Over the few thousand years after people first arrived in the area, the continuing good climate appears to have encouraged more to come, as evidenced by an increase in the density of artifacts in the higher, and therefore younger, sedimentary layers at Warratyi. A bone point, fashioned into a large, simple needle and dated to 38,000 years ago, suggests that people were using such tools for working animal hides—a full 10,000 years earlier than previously reported in Australia. "It is the kind of tool that might have been used to punch holes in animal hide, perhaps enabling people to make kangaroo skin

Duncan Johnston, one of the Adnyamathanha Traditional Owners, excavates in the Warratyi rock shelter. The shelter was once used by people whom the Adnyamathanha regard as their ancestors.

Dating to between 38,000 and 40,000 years ago, this sharpened bone point made from the shinbone of an animal similar to the wallaby measures just under an inch and is the oldest bone tool yet found in Australia.

bags to hold water," Hamm speculates. Similarly, the discovery of plant resin on the edge of stone tools suggests that the occupants were attaching tools to wooden handles, a process called hafting.

Eventually the good times came to an end, and at Warratyi, a dramatic decline in artifacts around 35,000 years ago coincides with the arrival of a colder and drier climate period, when Earth felt the grip of a glacial phase. "Life in this region would have become harder as the northern monsoons stopped coming as far south, meaning that lakes and rivers dried up, vegetation dwindled, and the previously abundant sources of game diminished," explains Hamm. But this difficult phase may have driven a period of innovation. In sediments dating to around 30,000 years ago, Hamm and his team discovered "backed" microliths, small blades with one edge blunted to allow stronger hafting—yet again 10,000 years earlier than previously recorded on the continent. "By 24,000 years ago, it would have been really tough to live in the arid zone, so it is fascinating to see these multifunctional and lightweight tools emerge," says Clarkson, "perhaps enabling the people to adapt their hunting techniques and move around more."

Backed microliths enabled more cunning hunting techniques. Their light weight allowed the blades to be used at a distance in projectile weapons, such as spears. And sometimes those spears could be sophisticated, containing multiple small blades, for example, that could embed in a prey animal, creating a wound that was likely to become infected, ultimately slowing the animal down. "This kind of hunting strategy would have enabled people to catch very agile animals, like the yellow-footed rock-wallaby, which moves incredibly fast," says Hamm.

Backed microliths emerged around 70,000 years ago in South Africa, and it has been argued that they are a marker of modern humans. Others think that the small blades are more of a temporary innovation that evolved independently many times over, in multiple locations, as an adaptive response to harsher environments. "The evidence from Warratyi appears to support the adaptive-response theory," says Clarkson.

By around 15,000 years ago the last Ice Age was on the way out in Australia, and a moister and more clement climate returned to the Warratyi region. A spike in artifacts in the rock shelter sediments from this time suggests that the friendlier weather helped the population grow again. At the site, unfortunately, rabbit burrows mix the sedimentary layers and muddy the story after that, but for the Adnyamathanha people, the shelter still feels like a direct connection with their ancestors. "Our people have always said that we've been here a long, long time," says Coulthard. "And these discoveries make me feel proud for all of our people." ■

Kate Ravilious *is a science journalist based in York, United Kingdom.*

TOOL TECHNOLOGY

A significant portion of the evidence gathered at Warratyi is in the form of stone tools. Their discovery has revealed unexpected levels of cultural and technological sophistication among the people who visited the shelter.

These adze tools, both made from chert, are between 24,000 and 30,000 years old. They are the earliest examples of hafted technology in Australia. Both were made to be able to fit into a handle and on one (right) dark patches of resin, used as adhesive, can be seen.

These tools, all made from silcrete, are between 24,000 and 30,000 years old, and are examples of backed technology. They have a sharp side and a blunt side so they can be held or placed in a handle. They move the date on backed technology in Australia by 10,000 years earlier than previously thought.

These tools are between 30,000 and 45,000 years old. Two are cores (left and middle), which are often used on their own or struck in order to dislodge a flake. The last tool is a flake that has been been struck in order to fashion sharper or more refined edges.

The earliest artifacts discovered at the Warratyi rock shelter are between 45,000 and 49,000 years old.

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A spiral temple sits atop a 3,000-year-old burial mound known as Montegrande in northern Peru's Amazon region.

LETTER FROM PERU

CONNECTING TWO REALMS

Archaeologists rethink the early civilizations of the Amazon

by Roger Atwood

The Amazon jungle wasn't supposed to have been the site of something this big. The mound, known locally as Montegrande, spans more than two acres at its base and stands as tall as a five-story building. It sits today amid rice paddies and cow pastures outside the Peruvian city of Jaén. Although it was overgrown with bushes and taken for a natural hill by people living nearby, the few archaeologists who had ventured to this remote corner of the western Amazon basin could not ignore the fact that it bore the features of an ancient burial mound: It had steep sides and a round shape, and there are no other hills around it.

When archaeologist Quirino Olivera began excavating Montegrande ("big hill") in 2010, he discovered that it was not only bigger, but also much older, than anyone had imagined. Once the vegetation had been cleared, he found pottery from a 1,000-year span of history near the surface. But just a few feet down, the ceramics disappeared, and Olivera began seeing evidence of architecture on an enormous scale. He uncovered sections of a long, semicircular wall, nine feet tall and coated in beige plaster, that was reached by a staircase made of boulders and packed earth. Later digging seasons, in 2012 and 2016, revealed a wide platform on the mound's eastern side that would have faced the rising sun. The depth and form of the structure and the absence of ceramics signaled that the mound dates from the late preceramic era, some 3,000 years ago. It could only have been built by an organized, complex society with hierarchies of

An intact ceramic pot (top) found next to Montegrande's spiral dates from centuries later than the original construction, attesting to the mound's long history of use. Montegrande (above) was thought to be a natural hill until archaeologists began excavations there.

workers and an agricultural scheme robust enough to feed them. It would have to have been the kind of society that, according to standing theories, had not yet spread from the cool Pacific coast—where the first known cities of the Americas were already thriving—over the Andes and into the Amazon. And yet, only eight miles from the Marañón River, a large Amazon tributary, the mound conveyed a sense of permanence. Nothing this big, this old, had ever been excavated in Peru's Amazon region. "It showed that complex worship, monumental architecture, and fixed societies had spread to the Amazon centuries earlier than once believed," says Olivera. "The structure is saying: 'We're here. We live in a settled society.'" But was it the only one of its kind?

Archaeologists' understanding of how people lived in the Amazon in ancient times has undergone a radical change in the last few decades. The old consensus was that the soil was too poor to support long-term settlement. It was thought that people moved from place to place, burning the forest and growing crops until the environment became too depleted, at which point they repeated the process. No one had found large ancient architecture in the Amazon, and its apparent absence supported the view that the area was sparsely populated and had no cities and that its people created little material culture beyond simple pottery. Spanish colonial accounts of big towns, thickly settled farmland, and flotillas of riverboats were seen as lies or exaggerations. This view, supported by research on the basin's meager soil and mineral endowments, was promoted by the distinguished archaeologist Betty Meggers of the Smithsonian Institution, who had worked mostly in Brazil and Ecuador from the 1940s almost until her death in 2012.

Meggers' theory of Amazonian settlement applied mainly to the humid lowlands, but archaeologists working on the forested slopes of the Amazon's western edge, where it meets the Andes, did not find evidence that contradicted her view. In the 1970s, Peruvian archaeologist Ruth Shady Solís excavated four sites near the town of Bagua, only 30 miles east of Jaén, and identified telltale signs of small-scale farming and pottery production, but, apart from a few minor mounds, no architecture on a scale that would indicate large, sedentary populations. Another researcher, Felipe Rojas Ponce, uncovered finely carved stone bowls at Huayurco, at the forested confluence of the Chinchipe and Tabaconas Rivers, but, again, no major public structures. The Amazon was seen as "the antithesis of culture," says Ecuadoran archaeologist Francisco Valdéz, a place where a misguided "environmental determinism held that the soil was incapable of supporting large populations." But scientific theses are naturally subject to revision. By the time Olivera began surveying sites for excavation, the Meggers view had already begun to crumble under the weight of fresh archaeological remains, which included mammoth ancient earthworks in Bolivia and road networks in Brazil.

Over the seven years he has excavated there, Olivera has established that the Montegrande pyramid has at least eight building phases, starting from the late

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The ancient coil at Montegrande has been interpreted as an image of swirling water, rotating heavenly bodies, a snail shell, or a vision inspired by the use of hallucinogenic drugs.

preceramic period in about 1000 B.C. and continuing for more than a millennium. At Huayurco, the lush riverside site about 40 miles north of Jaén where Rojas Ponce had worked in the 1960s, Yale University doctoral fellow Ryan Clasby found evidence in 2010 of uninterrupted settlement for roughly eight centuries, starting in about 800 B.C. He uncovered terraced earthworks, civic buildings, goods acquired through far-flung trade networks, and, he says, evidence of a sizeable population. They lived in Amazonian-style villages with dwellings strung out along the riverbank, not bunched into corral-like circles as in the Andes. "These were Amazon people, not migrants from somewhere else," says Clasby. "The settlements are spaced out in linear fashion, reflecting Amazonian traditions. They were a river people." He also found six-foot-high walls built some 1,500 years before the arrival of the Spaniards. "There is no way you can look at these structures and not see that these people had very specialized knowledge about how to handle physical space," says Olivera, "knowledge a society develops over centuries. They weren't going from place to place, living in grass huts, and then moving when they exhausted the soil."

In its size and antiquity, there is much to wonder at, but Montegrande has another curious feature. Near its summit, two feet below the surface, Olivera found an arrangement of rocks in the form of a spiral, about 40 feet in diameter. The rocks coil up and around the outside of the mound like a huge snake. At its top, it suddenly coils in on itself to create a shallow depression. In that hole, Olivera found ash that he believes to be the remains of ancient ritual fires. In 2016, Olivera excavated the depression further and found, beneath the ash, a thick layer of stones that he suspects protect a tomb deep in the center of the mound.

Olivera's first instinct, as the Montegrande coil emerged, was to interpret the feature as a giant astronomical instrument. The spiral could be seen as resembling the paths of heavenly bodies. And he noticed that the stones end in a manner that positions the tip of the coil at the spot where the sun rises from behind a distant hill at certain times of year. "The logical inference is that it was built according to an astronomical observation," says Olivera, though determining exactly how it worked and what it measured will take more study. Only one other such spiral design has been identified in the Amazon. A few years earlier, Valdéz had found similar, but smaller, spirals at a site he named Santa Ana-La Florida, over the border in Ecuador, about 100 miles north of Jaén. He believes the spirals were part of an ancient altar.

Clasby has a different interpretation of the spirals at Montegrande and Santa Ana-La Florida. He thinks they represent visions that came from taking hallucinogens. The ritual use of psychotropic drugs in the Amazon and Andes is well known. Ancient shamans ingested plants such as *vilca* and San Pedro, and possibly prepared and drank ayahuasca—the first a tree whose seeds are toasted and ground into a mind-bending snuff, the second a cactus, and the third a vine that is boiled with the leaves of the *chacruna* shrub to make a weedy, intensely hallucinogenic brew. These substances are still in use in the Amazon today, by locals and tourists alike.

With all three drugs, partakers will usually vomit or have diarrhea or both (accounting for a common name for ayahuasca: *la purga*, the purgative), followed by a torrent of visions, sounds, and hallucinogenic bliss—or, in some cases, terror. A shaman may sing to the plants' spirits to stimulate visions, but it's primarily an inward experience through which users gain insight into some problem or illness. With ayahuasca, sometimes whole communities ingest the brew, sometimes just the shaman, though "most of the time it's somewhere in between," says Jeremy Narby, a Stanford-educated anthropologist who has written extensively on the modern use of hallucinogens in the Amazon. Clasby believes that any tomb beneath the center of the Mon-

(continued on page 62)

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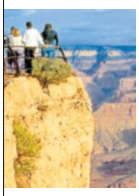

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tegrande coil is likely that of a priest or shaman who took one or more of these narcotics in order to tap into wisdom or see the future.

At the center of the Montegrande spiral, archaeologists found ashes from ritual fires and traces of an as-yet unexcavated tomb.

Different people see different things when they take Amazonian hallucinogens, but if there's one common apparition, it's spirals. "At the beginning you see flashing lights and swirls that lead into animal figures, such as coiling snakes," says Clasby, who took ayahuasca—which is legal in Peru—with a shaman in the jungle port of Iquitos. "Hallucinogens helped inform a whole way of seeing the world, a broad cosmology that was then applied to the landscape with spirals." They were creating, perhaps, an indelible expression of their culture.

After snorting vilca seeds, the effect of which is comparable to that of LSD or mescaline, German anthropologist Christian Ratsch wrote in the 1996 *Yearbook for Ethnomedicine and the Study of Consciousness*, "After about five minutes I grew aware of swirling, dancing phosphenes in my visual field....The rapidly shifting array of patterns transformed itself into a chaotic current of spermatozoa. These teemed and writhed in all directions at once, giving the sensation that they were on a mission to fertilize the entire cosmos." As part of his study, he references swirling stone carvings at yet another site, Chavín de Huántar. Chavín de Huántar dominated the northern Andes in the first millennium B.C., precisely the time when Montegrande's spiral was created. He writes, "A panorama of flowing designs—the exact patterns depicted in the nimbus surrounding the head of the Chavín deity!" Art historian Constantino Manuel Torres of Florida International University and another researcher, Jonathan Ott, wrote in 2006 that they took vilca snuff and, four minutes later, saw "brilliantly swirling geometric patterns."

When the people of Montegrande were laying out their stone spiral, in about 1000 B.C., Chavín de Huántar was a ritual site that drew pilgrims from across the Andean realm and exercised a deep cultural influence over the whole region. Hallucinogenic imagery from the jungle was a major part of its cultural signature. Located high in the Andes, 300 miles south of Jaén, Chavín de Huántar's sprawling network of tunnels, towers, and intricate stone carvings of supernatural animal-human hybrids survives largely intact today. Richard Burger of Yale University has studied those stone carvings in detail and documented how they depict the use of mind-altering drugs. Some carvings show a man's face gradually morphing into a jaguar or a serpent or some phantasmagoric combination of the two, while long strips flow from the figures' noses. Those strips represent mucus from glands inside the nose irritated by vilca snorting, Burger maintains. The bulging eyes and crazed expressions of drug users are also carved in the stone. Archaeologists have discovered ancient drug paraphernalia such as snuff spoons and mortar grinders used to mash vilca seeds at Chavín de Huántar.

The cult that thrived at Chavín de Huántar spread throughout the Andes, facilitated by drugs that came from the Amazon. Vilca is a lowland plant that must have been imported, probably along with feathers and animal skins, although almost nothing of any of these organic materials survives in the archaeological record. Researchers at Chavín de Huántar have discovered stone bowls decorated with Amazonian fish and snake motifs almost identical to those found near Jaén, clear evidence of trade ties, Burger says. The Marañón River flows as straight as a highway from Chavín de Huántar due north to Montegrande, providing an obvious trade route. Along with hallucinogens came images and symbols. The jaguars and monkeys carved in stone at Chavín de Huántar could never actually live in the frigid mountains nearby—they were exotic jungle fauna. "Chavín de Huántar was closely linked to the upper Amazon [near Jaén]," says Burger. "Chavín's culture drew much of its religious myth and ceremony from the forested slopes of the upper Amazon."

Burger visited the Montegrande spiral last year before Olivera was forced to rebury the site and post a 24-hour guard to protect it pending conservation work and construction of a permanent roof. The spiral is perplexing to Burger, and he isn't sure what it signifies. "It could be related to hallucinogens, but then it might be related to other spiral phenomena such as whirlpools in rapids or the shape of various kinds of shells," he says. The centrality of hallucinogens in early Andean worship is clear, however, he adds. As they faced a random universe, with its disease, earthquakes, and El Niño storms, drugs gave them a way to understand phenomena that went beyond ordinary comprehension. They wanted to gain power over the subconscious and use

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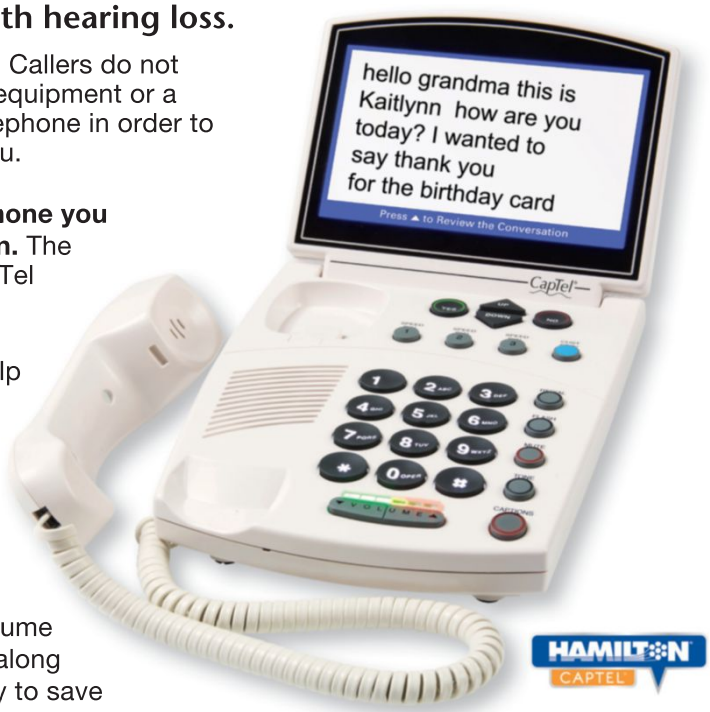

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it to predict the future. "It's likely that Chavín had an oracular function," says Burger, "and hallucinogens may have played a role in making predictions or explaining past events."

At Santa Ana-La Florida, Valdéz's excavations have revealed a village with about 20 stone circles, each up to 40 feet in diameter, a sunken plaza, and a wide ceremonial platform on a bluff overlooking the rushing river. "It's hardly what you'd expect of a simple settlement or even a small village," says Valdéz. Like Huayurco and numerous other Amazonian sites, the ancient village was built at the convergence of two rivers, a place believed to possess transcendent cosmic energy. Valdéz, now at the Research Institute for Development in Paris, believes the site was a civic or ceremonial center where people from surrounding valleys gathered for rituals led by a charismatic leader. Stone spirals, smaller than those at Montegrande, coil up from the structures, like snakes ready to strike. "The logical interpretation of this spiral architecture is that it represents a sacred ideology, imbued with the notion of movement between different realms of reality," he says. "This was expressed in rites and ceremonies during which it was common to consume hallucinogens."

The evidence from Santa Ana-La Florida is in agreement with the emerging view of life in the ancient Amazon. People resided in fixed, well-built settlements, with imposing ceremonial centers and complex rituals that relied on visions and insights supplied by hallucinogens. They proudly traded their medicinal plants and crafts with Andean cultures. And there is proof that they stayed in one place for extended periods. Valdéz ran 32 radiocarbon dating tests on charcoal samples and found that the settlement at Santa Ana-La Florida dates as far back as 3300 B.C. Dates associated with the main ceremonial center were clustered between 2800 and 1800 B.C., which would make it older than Montegrande, and nearly as old as centers on the north-central Peruvian coast such as Caral, often called the oldest known city in the Americas.

Spirals such as this one that is similar to—but even older than—those at Montegrande have been found at Santa Ana-La Florida in Ecuador, suggesting region-wide belief systems in the ancient Amazon.

A mile up a dirt road from Montegrande stands an even bigger and, judging from Olivera's first excavations, potentially even older mound. Occupied today by an elderly man with chickens and barking dogs, the mound, which is known as San Isidro, was excavated by Olivera in 2010 and 2012. It held the remains of 22 children and newborns buried over a period of several centuries in the first millennium B.C. If Montegrande was the local center for shamanic ritual, San Isidro may have been where parents took sick or dying children to be cured—or sacrificed. Bones unearthed at San Isidro show signs of trauma and deformation. A newborn dating from about 800 B.C., who had been decapitated, was found entwined in the arms of a young woman, who had also been decapitated. The remains of a boy aged about six, his teeth showing signs of severe iron deficiency, were buried with guinea pigs, river crabs, and a shell necklace still around his tiny neck.

A few feet away, Olivera uncovered the remains of the mound's resident healer or priest, his face turned toward the east, as if awaiting the rising sun. His body was adorned with some 180 snail shells, whose shapes echo that of the Montegrande spiral. Peruvian archaeologists often give names to the charismatic dead, and Olivera calls this man "The Lord of Snails." He died around 2,800 years ago, judging from the pottery sherds buried with him, and he must have been a prominent member of his community at a time of major technological change, as the introduction of ceramics revolutionized the way people stored and carried food. In the still-earlier layers beneath his tomb, the sherds disappear, and the mound's as-yet unexcavated history trails off into the earliest millennia of Amazonian civilization. ■

Roger Atwood ***is a contributing editor at*** **Archaeology.**

GRANT WINNERS

THE JULIE HERZIG DESNICK ENDOWMENT FUND FOR ARCHAEOLOGICAL FIELD SURVEYS

Sarah Craft, in Serbia

Sarah Craft
Postdoctoral Fellow, Classics, Florida State University
Codirector of the Timok Regional Archaeological Project (TRAP) in Serbia

The Roman imperial palace at Felix Romuliana (known today as Gamzigrad), a UNESCO World Heritage site in Serbia, was built by the Roman emperor Galerius in the fourth century A.D. on the site of the village in which he was born. Craft's research, using remote sensing, archaeological site survey, and excavations, will examine the social and economic impact of the palace on the region and the local population in antiquity. The TRAP project will recreate the ancient landscape, identify the network of roads that connected the palace to the rest of the Roman Empire, locate the mines and quarries that would have provided economic resources for the emperor, and track changes in human settlement patterns from the earliest human occupation in the region to the present day.

THE ELLEN AND CHARLES STEINMETZ ENDOWMENT FUND FOR ARCHAEOLOGY

João Cascalheira, in Mozambique

João Cascalheira
Postdoctoral Researcher, Interdisciplinary Center for Archaeology and Evolution of Human Behavior, University of Algarve, Portugal

Cascalheira's research focuses on stone-tipped, long-distance weapons used during the Upper Paleolithic in southwestern Europe. They are considered an important factor in the spread of modern humans from Africa into western Eurasia, but questions remain about how the technology changed and how those changes benefited humans. Cascalheira will create a comprehensive database of 3-D scans of Upper Paleolithic stone points in order to develop a specific ballistic profile for each type of projectile. This will allow him to assess the benefits and drawbacks of using a specific type of point as a hunting weapon, understand why particular designs and technologies were chosen over others, and explore how changes were made through time.

SAVE THE DATE!

AIA-SCS JOINT ANNUAL MEETING IN BOSTON: JANUARY 4–7, 2018

The 119th Joint Annual Meeting of the Archaeological Institute of America (AIA) and the Society for Classical Studies (SCS) will take place in Boston, Massachusetts, January 4–7, 2018, at the Boston Marriott Copley Place. The Annual Meeting begins on Thursday, January 4, with a public lecture by John Papadopoulos (Department of Classics, UCLA), followed by the opening night reception. Academic sessions begin on Friday, January 5, and conclude on Sunday, January 7.

The deadline for proposing workshops and submitting abstracts for open paper and poster sessions, and for resubmitting provisionally accepted colloquia and workshops is Sunday, August 6 (or Sunday, August 20, with a $25 fee). The deadline for submissions for lightning sessions and to organize roundtables is Wednesday, November 1.

If your organization would like to exhibit at the Annual Meeting, please visit archaeological.org/meeting/exhibithall for information. More than 50 companies are represented at each meeting, and we welcome new international and domestic exhibitors and attendees. If you have questions or want to be added to the distribution list for exhibit hall information, please contact Kevin Mullen at kmullen@aia.bu.edu.

For information on the program, travel discounts, and more, visit archaeological.org/annualmeeting. See you in Boston!

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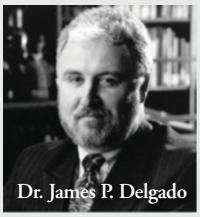
SPECIAL SPRING EVENTS

This spring, the AIA had the pleasure of presenting two special benefit events in New York City with the theme "Windows into the Past: Through the Eyes of an Archaeologist."

Dr. Irving Finkel

On April 4, philologist and Assyriologist Dr. Irving Finkel, Assistant Keeper of the Department of the Middle East at the British Museum, gave a talk titled "Babylonian Devils, Demons, and Ghosts." Finkel has been a cuneiform tablet curator at the museum since 1979 and is especially interested in ancient magic and medicine, cuneiform literature, and the history of the world's board games. The lecture was held in the ballroom at the Cosmopolitan Club and was followed by a reception.


Dr. James P. Delgado

Dr. John Hale

On May 17, the AIA welcomed Dr. James P. Delgado and Dr. John Hale to the exhibition hall of the Grolier Club to speak about their fascinating work in underwater archaeology. Delgado, senior vice president of SEARCH, a global provider of cultural resources services, presented "The Deep Sea, Robots and Satellites: Venturing into Archaeology's Final Frontier on Earth." Hale, director of liberal studies for the College of Arts and Sciences and adjunct professor of archaeology at the University of Louisville, Kentucky, presented "From Ancient Harbors to Sunken Cities: Exploring Submerged Sites through Underwater Archaeology." After the lectures, a reception was held in the Grolier Club's rare book room.

The events were made possible by the generosity of sponsors Bruce Campbell and Discovery Communications; Dr. Elizabeth Bartman (Cosmopolitan Club); and Mr. Brian Heidtke (Grolier Club). The AIA also wishes to thank speakers Dr. Irving Finkel, Dr. James P. Delgado, and Dr. John Hale for their wonderful talks. Finally, the AIA is grateful to all those who purchased tickets or made contributions in support of these events.

FALL APPLICATION DEADLINES

FOR AIA FELLOWSHIPS AND GRANTS

Harriet and Leon Pomerance Fellowship to support a project relating to Aegean Bronze Age archaeology. Deadline: November 1, 2017

Helen M. Woodruff Fellowship of the AIA and the American Academy in Rome to support a Rome Prize Fellowship for the study of archaeology or classical studies. Deadline: November 1, 2017

John R. Coleman Traveling Fellowship to honor the memory of John R. Coleman by supporting travel and study in Italy, the western Mediterranean, or North Africa. Deadline: November 1, 2017

Olivia James Traveling Fellowship for travel and study in Greece, Cyprus, the Aegean Islands, Sicily, southern Italy, Asia Minor, and Mesopotamia. Deadline: November 1, 2017

The Archaeology of Portugal Fellowship to support projects relating to the archaeology of Portugal. Deadline: November 1, 2017

C. Brian Rose AIA/DAI Exchange Fellowships: AIA Fellowship for Study in the U.S. Deadline: November 1, 2017. The Archaeological Institute of America and the German Archaeological Institute (Deutsches Archäologisches Institut) offer reciprocal study fellowships to promote contact between North American and German archaeologists.

Cotsen Excavation Grants to provide excavation support for professional AIA members working around the world. Deadline: November 1, 2017

Site Preservation Grant for innovative projects that use outreach and community development alongside direct conservation to sustainably preserve archaeological sites. Deadline: October 15, 2017

Samuel H. Kress Grants for Research and Publication in Classical Art and Architecture fund publication preparation, or research leading to publication, undertaken by professional members of the AIA. Deadline: November 1, 2017

The AIA Publication Subvention Program offers subventions from the AIA's von Bothmer Publication Fund in support of new book-length publications in the field of Greek, Roman, and Etruscan archaeology and art history. Deadline: November 1, 2017

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ARTIFACT BY JARRETT A. LOBELL

WHAT IS IT
Rosary bead
CULTURE
English
DATE
Late 15th century–early 16th century
MATERIAL
Bone
FOUND
Gloucester Cathedral, England
DIMENSIONS
1.14 inches long, 0.82–0.98 inches wide

Throughout human history, people have appealed, through prayer, to a divine power or powers for hope, solace, counsel, omens, and forgiveness. For Roman Catholics, one of the central rituals of their faith is the recitation of the Rosary, a cycle of prayers used to contemplate the lives of Mary and Jesus and the mysteries of salvation. The prayers of the Rosary are sometimes said while holding a string of beads, with each bead representing a prayer. This practice dates back to at least the Middle Ages, and perhaps earlier. In England, the use of prayer beads continued until the mid-sixteenth century, when the Protestant king Edward VI banned the use of rosary beads as one of the reformations of the Church of England. This artifact is thought to have formed the pendant terminal, or end, of a set of late medieval rosary beads.

The bead, which depicts a human face on one side and a skull on the other, is an example of "memento mori," an instruction to remember one's mortality and a common motif in high and late medieval art. "The image of the living body in juxtaposition with the dead can be seen as an exposition of the theme of the relatively brief nature of life and the inevitability of death," says Gloucester Cathedral excavation director Ross Shurety of Border Archaeology. Although rosary beads are fairly commonly recovered from medieval sites, memento mori elements are considerably rarer, explains Shurety. He says, "It's possible that the design of this rosary bead was made specially to order and originally belonged to a man of some wealth and status, who perhaps depicted himself."

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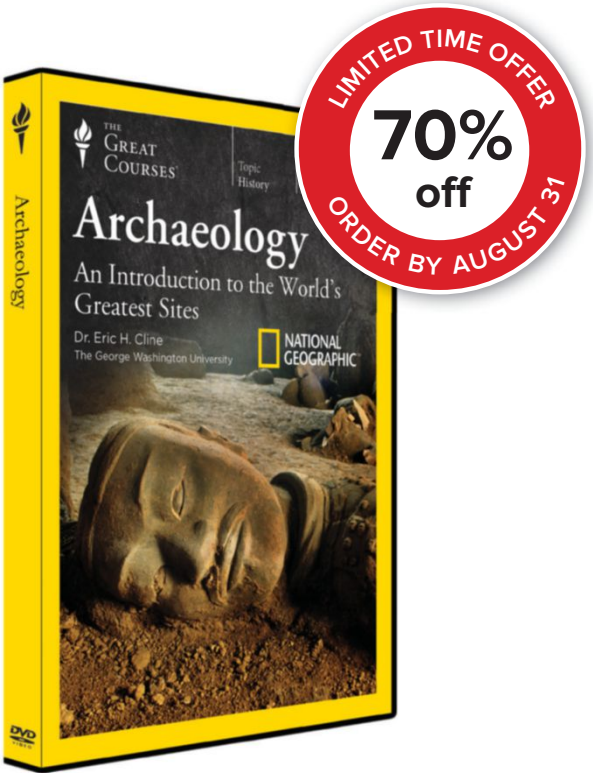

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